Includes: Operator's Manual, Parts Catalogue and Installation Instructions

Mahindra USA

Model 3715

3016 – 3616 ROPS Tractor

Backhoe

1503-1203
October 2010

WARRANTY CONDITIONS

Warranty Coverage:

Mahindra, Ltd, Inc., herein referred to as Mahindra, undertakes to replace or repair any part of a Mahindra loader where damage has been proven to be caused by defects in material or workmanship.

This Warranty is valid for a period of 1 year for all hydraulic components and buckets and for a period of 2 years for all other backhoe components from the date of the original retail sale. Parts replaced or repaired under the terms of this Warranty are guaranteed only until the original warranty expires.

It is further understood and agreed that the defect should be immediately reported to the Selling Dealer. The Selling Dealer will generally perform Warranty repairs or replacements and the Purchaser shall deliver the Mahindra Loader to the Dealer's place of business for repair. In the event Purchaser is located more than 75 miles from the Selling Dealer, any Mahindra Dealer authorized to sell and service Mahindra Products may perform the repair at its dealership.

The obligation of Mahindra to the Purchaser under this Warranty is limited to the repair or replacement of defective parts by an authorized Mahindra dealer. Repair or replacement in accordance with this Warranty shall constitute fulfillment of all liabilities of Mahindra and the Selling Dealer in respect to Mahindra Loaders.

There are no warranties beyond those which expressly appear herein. Any implied warranty of merchantability or fitness for a particular purpose is specifically excluded here from.

Warranty Provisions:

Mahindra's liability under this Warranty is subject to the observance by the Purchaser of the following provisions:

- The purchaser shall at all times in the operation of any Mahindra Product, use those brands and grades of lubricating oils, lubricants or fuel and spare parts officially approved by Mahindra.
- The Mahindra Loaders shall have been used in accordance with the procedures specified in the Operator's Manual. This Warranty does not extend to damage resulting from misapplication, abuse, misuse, failure to perform maintenance, negligence, fire, accidents or changes or faulty mounting carried out by the Purchaser. When making a Warranty exchange of parts, the Purchaser shall compensate Mahindra for the time that the parts have been used if they have been exposed to extreme wear.
- Compensation is not paid for physical harm, deadlock, resulting damages, or other losses.
- To obtain warranty service, the Purchaser must (1) report the product defect to an authorized Mahindra dealer and request repair within the applicable warranty term and (2) present evidence of purchase or date of original use.
- The Warranty shall be void if the Mahindra Loader has been altered or repaired outside of a Mahindra dealership in a manner, which, in the sole judgment of Mahindra, affects its performance, stability, or reliability.
- The customer shall be responsible for transportation expenses for the Mahindra Loader to the dealership or travel of dealer personnel to customer location for Warranty repair. The customer shall also pay any premium for overtime labor requested by the customer.
- Temporary repairs or additional costs due to the work being performed after normal working hours will not be compensated.
- The above warranty is in lieu of all other warranties on Mahindra's behalf and neither party assumes any other liability in connection with Mahindra's Products.
- Any dispute arising between Mahindra and the Purchaser concerning the liability of Mahindra under this warranty shall be subject to the laws of the State of Texas.

Right To Make Design and Product Changes:

Mahindra reserves the right to make changes in the design and other changes in its Mahindra Products at any time without incurring any obligation with respect to any product previously ordered, sold or shipped.

DEALER PREPARATION CHECK LIST

BEFORE DELIVERING MACHINE:
The following check list should be completed.
Use the Operator's Manual as a guide.

Before operating backhoe, check that your Dealer has covered the following information with you:

_____Equipment has been completely assembled as directed.
_____Equipment has been functionally tested for proper operation.
_____All safety decals are readable (see decal pages).
_____Purchaser has been instructed in proper & safe operating methods:
- _____Operators Safety Precautions
- _____Tractor Wheel Tread-Tire & Inflation Recommendations
- _____Tractor Hydraulic System & Backhoe Controls
- _____Tractor is equipped with Loader and must be mounted when Backhoe is installed on Tractor.
- _____Hydraulic System Oil Level
- _____Proper Backhoe Operation
- _____Backhoe Dismounting
- _____Backhoe Mounting
- _____Lubrication - Service Care
- _____Storage

_____Warranty Coverage & Operators Manual explained to purchaser.
_____Operators Manual has been delivered to purchaser.

Dealer's Signature_____

CAUTION: It is recommended that the tractor be equipped with Rollover Protection System (ROPS) and seat belt be used for all implement operations.

NOTE: This checklist is to remain in owner's manual.
It is the responsibility of the dealer to complete the procedures listed above before delivery of this implement to the customer.

IMPORTANT

These backhoes can only be installed on tractors equipped with a Mahindra loader.

CONGRATULATIONS

You are now the proud owner of a MAHINDRA 3715 Backhoe. This backhoe is a product of quality engineering and manufacturing. It is made of fine materials and under a rigid quality control system. It will give you long, satisfactory service. To obtain the best use of your backhoe, please read this manual carefully. It will help you become familiar with the operation of the backhoe and contains many helpful hints about backhoe maintenance. The immediate use of new techniques in the manufacture of products may cause some small parts of this manual to be outdated. Mahindra dealers will have the most up-to-date information. Please do not hesitate to consult with them.

Because Mahindra maintains an ongoing program of product improvement, we reserve the right to make improvements in design or changes in specifications without incurring any obligation to install them on units previously sold.

Because of the possibility that some photographs in this manual were taken of prototype models, production models may vary in some detail. In addition, some photographs may show shields removed for purposes of clarity. Never operate this implement without all shields in place.

RETAIL CUSTOMER'S RESPONSIBILITY UNDER THE MAHINDRA WARRANTY

It is the Retail Customer and/or Operator's responsibility to read the Operator's Manual, to operate, lubricate, maintain, and store the product in accordance with all instructions and safety procedures. Failure of the operator to read the Operator's Manual is a misuse of this equipment.
It is the Retail Customer and/or Operator's responsibility to inspect the product and to have any part(s) repaired or replaced when continued operation would cause damage or excessive wear to other parts or cause a safety hazard.
It is the Retail Customer's responsibility to deliver the product to the authorized Mahindra dealer from whom he purchased it, for service or replacement of defective parts which are covered by warranty. Repairs to be submitted for warranty consideration must be made within forty-five (45) days of failure.
It is the Retail Customer's responsibility for any cost incurred by the Dealer for traveling to or hauling of the product for the purpose of performing a warranty obligation or inspection.

SAFETY ALERTS

This symbol, the industry's "Safety Alert Symbol," is used throughout this manual and on labels to warn of the possibility of personal injury. When you see this symbol, carefully read the messages and be alert to the possibility of injury or death. It is essential you read these instructions and safety regulations before you attempt to assemble or use this unit.

DANGER:	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
WARNING:	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION:	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
IMPORTANT:	Indicates that equipment or property damage could result if instructions are not followed.
NOTE:	Gives helpful information.

SAFETY

Most tractor and/or backhoe equipment accidents can be avoided by following simple safety precautions.
The safety information given in this manual does not replace safety codes, insurance requirements, federal, state, and local laws. Make sure your machine has the correct equipment required by your local laws and regulations.
Understand that your safety and the safety of other persons are measured by how you service and operate this backhoe attachment.
Know the position and operations of all controls before you try to operate. Make sure you check all controls in a safe area before starting.
Read this manual completely and thoroughly and make sure you understand all controls. All equipment has a limit. Make sure you are aware of the stability and load characteristics of this backhoe before you begin operation.
In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training of personnel in the operation, transport, maintenance and storage of equipment. Lack of attention to safety can result in accident, personal injury, reduction of efficiency, and worst of all—loss of life. Watch for safety hazards and correct deficiencies promptly. Use the following safety precautions as a general guide to safe operations when using this machine. Additional safety precautions are used throughout this manual for specific operating and maintenance procedures. Read this manual and review the safety precautions often until you know the limitations.

This safety alert symbol indicates important safety messages in this manual. When you see this symbol, carefully read the message that follows and be alert to the possibility of personal injury or death.

SAFETY PRECAUTIONS

1. A careful operator is the best operator.
2. Most accidents can be avoided by taking certain precautions.
3. The following precautions are suggested here to help prevent accidents.

READ MANUALS AND DECALS

4. Read and understand both the vehicle and the backhoe Operator Manuals and all decals before operating vehicle and backhoe.
5. Learn how to operate your tractor and backhoe safely.
6. Knowledge is necessary for safe operation.
7. Lack of knowledge can lead to accidents.
8. It is the owners' responsibility to make sure anyone operating the vehicle and backhoe reads and understands this manual first before operating the machine.
9. Follow all safety, operating, and service instructions.
10. Follow all safety decals on the vehicle. Keep safety decals clean. Replace damaged or illegible safety labels. See following pages for required safety labels.

ROPS AND SEAT BELT AND PPE

11. Equip your tractor with an approved rollover-protective structure (ROPS) and seat belt for your protection.
12. Keep foldable ROPS systems in "Locked UP" position at all times.
13. Operator should wear personal protective equipment (PPE), such as, protection for eyes, ears, lungs, head, hands and feet when operating, servicing, or repairing equipment.
14. PPE should include but is not limited to safety hard hat, safety glasses, safety shoes, and other PPE.
15. Avoid wearing loose clothing or jewelry that may catch in moving parts.
16. Protect your eyes – wear safety glasses.
17. Do not wear radio or music headphones while operating machine.
18. Loud noise can cause impairment or loss of hearing, wear a suitable protective device such as earplugs.
19. Check seat belt daily and replace if frayed or damaged.
20. Proper use of seat belt & ROPS is recommended. Falling off vehicle or overturning unit can result in serious injury or death.

SAFETY PRECAUTIONS

OPERATOR

21. Pay attention to the job at hand. Safe operation requires your full attention. Do not let your mind lose concentration on what you are doing.
22. Do not attempt to enter operator's platform of backhoe by using the stabilizers as a step.
23. Use the steps and handrail when getting on/off the vehicle. Failure to do so could cause a fall.
24. Operator should be familiar with the controls, all safety precautions, and all potential hazards.
25. Operate vehicle and backhoe controls only when properly seated in operator's seat.
26. Never operate backhoe by standing up on, or beside the machine.
27. Only one person, the operator, should be on the machine when it is in operation.
28. Only one person, the operator, should operate the backhoe at any time.
29. Make sure that only responsible individuals with proper instruction operate the equipment.
30. Never allow anyone under raised stabilizers or raised backhoe.
31. While operating backhoe, keep your body in operator's area only. Do not place any part of your body in front of console area. Failure to follow these instructions could cause operator to be injured.
32. Operator must keep hands and body out of the area between the backhoe and tractor when mounting and dismounting the backhoe. Failure to follow these instructions could result in serious injury.

OTHERS

33. Do not take passengers on the vehicle or backhoe. There is no safe place for a passenger.
34. Do not lift or carry people on the backhoe or in bucket as they could fall or be crushed.
35. Do not smoke when refueling the vehicle. Allow room in the gas tank for expansion. Wipe up any spilled fuel. Secure cap tightly when done.

TRACTOR

36. Move wheels to the tractor manufacturer's widest recommended settings to increase stability.
37. Provide adequate front end weight to counter-balance the backhoe at all times. 20% of the total tractor and/or loader and backhoe weight must be on the tractor front axle. If unsure of weight distribution, determine at a weight scale.

BACKHOE

38. Know the limitations of your equipment. Do not use equipment for anything other than what it was originally designed.
39. Do not use backhoe to lift things.
40. Do not use backhoe to push things or as a battering ram.
41. Do not attach chains, ropes, cables, etc. to backhoe for pulling purposes.
42. Do not attempt to raise the tractor off the ground or move the tractor forward or backward using the backhoe dipper assembly or bucket.
43. Use backhoe only for digging.
44. Do not remove any guards on backhoe or vehicle.

BEFORE OPERATION

45. Know your controls. Read this operator's manual and the manual provided with your vehicle. Learn how to stop the vehicle, engine, and backhoe quickly in an emergency.
46. Disengage transport locking pins before attempting to operate the backhoe.
47. Do not smoke when refueling the vehicle or when operating backhoe. Allow room in the gas tank for expansion. Wipe up any spilled fuel. Secure cap tightly when done.
48. Inspect the vehicle before you try to operate the unit. Check for needed maintenance or repairs and be sure to have them done before using the equipment.
49. Check hardware that attaches backhoe to vehicle and all pivot pins for tightness several times daily. Replace any parts that are bent, broken, or missing.
50. Check vehicle brake action before operation. Adjust or service brakes as necessary.
51. Inspect machine before operation. Be sure hardware is tight. Repair or replace damaged, worn, or missing parts. Be sure guards and shields are in good condition and fastened in place. Service unit as instructed in service section. Make any necessary adjustments before operating unit.

SAFETY PRECAUTIONS

52. Remove 3-point tractor links before installing backhoe to tractor.
53. Do not operate the 3-point hitch system while the backhoe is installed. The system is live and pressure must be removed to prevent overheating and damage to the hydraulic system.
54. Make sure all hydraulic hoses and fittings are in good condition and not leaking, twisted, kinked, or frayed before starting the tractor or using the equipment.
55. Before starting the engine of your tractor, make sure all operating controls are in park lock or neutral position.
56. Be certain lights and safety markings, as provided by the tractor manufacturer, are clean and operating when transporting the tractor/backhoe on public roads. Be certain that the Slow Moving Vehicle (SMV) emblem is visible. Check with local law enforcement for specific requirements.
57. Visually inspect the backhoe for bent, loose, cracked, damaged, or missing parts. Replace as required.
58. Check all hydraulic connections for leaks and all hoses for proper positioning to reduce wear during operation. Retighten or reposition as required
59. Check backhoe attachment bolts for tightness. Retighten after the first eight working hours, and after every 40 working hours. See bolt torque chart in this manual.

WORK AREA

60. Keep all bystanders a safe distance away. Stop machine if anyone enters work area.
61. Always be watchful of bystanders when operating backhoe or when moving stabilizers.
62. Block off work area from all bystanders, livestock, etc. Allow plenty of room for backhoe reach and swing. Position a barricade around the work area.

OPERATION

63. Lack of knowledge can lead to accidents.
64. Move and turn vehicle at low speeds.
65. Never leave the unit unattended with the engine running. Follow vehicle operator's manual for correct operation.
66. Never operate unit with covers or shields removed.
67. Transport backhoe only in transport position with transport locks placed in locked position.
68. Reduce speed when driving over rough terrain, on a slope, or turning, to avoid overturning the vehicle or loss of steering because of weight transfer.
69. Look before backing.
70. Do not operate backhoe unless there is adequate operator clearance.
71. Do not attempt to lift loads in excess of vehicle or backhoe capacity.
72. If unit contacts an object, stop machine and inspect it. Make repairs before continuing operation.
73. Keep loaded bucket low.
74. Do not contact stabilizers and/or stabilizer cylinders with bucket. Damage to these components caused by operator are not covered under warranty.
75. Never work under raised backhoe components. Accidental movement of valve handles or a leak in the hydraulic system could cause bucket to dump, dipper assembly to drop, or stabilizers to release causing serious injury.
76. Do not drive the vehicle near the edge of a ditch or excavation.

AFTER OPERATION

77. Always lower the backhoe bucket and stabilizers to the ground, stop tractor engine, place transmission in park (or neutral), engage parking brake, cycle all hydraulic controls to relieve pressure, allow machine moving parts to stop, and remove ignition key to prevent unauthorized person from starting engine before dismounting tractor or servicing, repairing, or making adjustments to the equipment or when not digging.

DIGGING

78. Use backhoe only for digging.
79. Never dig with the backhoe unless the stabilizers are properly set.
80. Keep bucket away from the stabilizers and/or stabilizer cylinders to avoid possible damage. Damage to these components caused by operator are not covered under warranty.
81. Do not dig close to stabilizers, the ground could collapse from under the backhoe.

SAFETY PRECAUTIONS

ELECTRICAL AND UTILITIES

82. Watch for overhead and underground high voltage electrical lines. Do not touch wires with any part of the backhoe.
83. Check your work and verify location of all above ground hazards including electrical lines, fence posts, obstacles, etc. Avoid contact.
84. Check your work and verify location of all below ground hazards including water, gas, sewage, and electrical lines and pipes. Avoid contact.

HYDRAULIC

85. Escaping hydraulic fluid under pressure can have sufficient force to penetrate skin, causing serious injury. Before disconnecting lines, be sure to relieve all pressure. Before applying pressure to system, be sure all connections are tight and that lines, tubes, and hoses are not damaged. Fluid escaping from a very small hole can be almost invisible. Use a piece of cardboard or wood, rather than hands, to search for suspected leaks. If injured by escaping fluid, see a doctor at once. Serious infection or reaction can develop if proper medical treatment is not administered immediately.
86. Do not adjust backhoe relief valve setting. They are factory set for best backhoe performance and safety. They should be adjusted only by a qualified service person. Incorrect valve setting could result in equipment damage and/or serious injury.
87. After connecting equipment, hoses or doing any hydraulic maintenance, purge any air in the system by operating all hydraulic controls several times

SLOPES

88. Set brakes and block wheels when operating on hills and banks to avoid dangerous runaway.
89. Reduce speed when driving over rough terrain, on a slope, or turning, to avoid overturning the vehicle or loss of steering because of weight transfer.
90. Avoid using dipper assembly at full reach when on a slope to prevent upsets.
91. Always dig downhill from unit when on a slope.
92. Avoid swinging bucket downhill when on a slope to prevent upsets.
93. Always swing bucket uphill to dump when on a slope.
94. Do not park vehicle on a steep incline.
95. Use care when operating on steep grades to maintain proper stability.

TRANSPORTATION

96. Lower backhoe to ground when dismounting backhoe. This will increase the stability of the parked unit.
97. Always use accessory lights and devices when transporting on a road or highway to warn operators of other vehicles and to prevent accidents. Check your local government regulations.
98. Be sure SMV emblem is visible to the rear.
99. Never transport unit with covers or shields removed.
100. Always engage the boom and swing transport locking pins before transporting backhoe. Failure to do so could cause an unstable traveling condition.
101. Allow for height of backhoe when transporting unit so as not to catch unit on low overhangs or wires.
102. Do not drive close to ditches, excavations, etc., cave in could result. Drive slowly over rough terrain.
103. Do not operate the backhoe unless it is rigidly attached to the tractor

ADJUSTMENTS AND INSPECTION

104. Always wear safety goggles or glasses when working on equipment.
105. Observe proper maintenance schedules and repairs to keep unit in safe working order.
106. Always engage transport locking pins before servicing backhoe.
107. Never work under raised stabilizers or a raised backhoe.
108. Never work on equipment while it is running or while the system is under pressure, or the cylinders are under load.
109. Do not smoke when refueling the vehicle. Allow room in the fuel tank for expansion. Wipe up any spilled fuel. Secure cap tightly when done.

SAFETY PRECAUTIONS

MAINTENANCE AND REPAIR

110. Always wear safety goggles or glasses when working on equipment.
111. Always engage transport locking pins before repairing backhoe.
112. Block up equipment, set hand brake, lower bucket and stabilizers, turn off the tractor and remove the key before performing repairs.
113. Use a brass drift and hammer of non-sparking material when servicing or replacing pins to prevent pins from shattering.
114. Do not modify the backhoe in any way unless authorized by Mahindra USA, Inc. to do so. Unauthorized modifications could result in equipment damage and/or serious injury.

DANGER, WARNING, AND CAUTION DECAL SAFETY MESSAGES

0595-3060 IMPORTANT DECAL

1. The backhoe bucket is capable of contacting this stabilizer and/or cylinder. Careful operation will avoid backhoe damage.

Damage to these components caused by operator is not covered under warranty.

0595-3061 DECAL

2. Swing chain adjustment. See Backhoe operator's manual for adjustment and maintenance.

0595-3062 CAUTION DECAL

3. Be sure to purge all the air from the hydraulic system before attempting to raise or lower this machine. Refer to operator's manual for further details.

0595-3063 WARNING DECAL

To avoid serious injury or death:

4. Do not operate this backhoe unless it is rigidly attached to the tractor using the appropriate factory – provided mounting kit.

0595-3064 IMPORTANT DECAL

5. Improper transporting methods can cause serious damage to tractor.
6. Engage transport locking pins when transporting backhoe.
7. Travel slowly over rough terrain.
8. When transporting on truck or trailer, lower backhoe boom assembly so bucket rests firmly on bed. Apply restraints to tractor, not to backhoe or backhoe attaching kit.

0595-3065 WARNING DECAL

9. Raised backhoe boom assembly, dipper assembly, and bucket can fall from hydraulic system failure. To avoid serious injury or death:
10. Block up or securely support backhoe boom assembly and dipper assembly before working underneath.
11. Do not use hand or skin to check for hydraulic leaks. Use cardboard or wood. Wear eye protection.
12. High pressure oil leaks can penetrate skin causing serious injury and gangrene. Consult a physician immediately.
13. Lower backhoe to ground and release hydraulic pressure before loosening fittings.
14. Refer to operator's manual for details.

0595-3067 CAUTION DECAL

To avoid serious injury or death:

15. Read operator's manual before using backhoe.
16. Operate backhoe controls only from normal backhoe operator's seat position.
17. Operate only with stabilizers down and on firm footing. Avoid digging in area of stabilizer pads. Stay clear of steep areas or excavation banks that could give way.
18. Check the operating area to be dug for any possible overhead or underground lines such as electrical, gas, oil, water, etc. Extreme caution must be exercised in areas where these are present. Consult local utilities before digging.
19. Keep bystanders away from maximum swing reach area and stabilizers.
20. Keep all guards in place.
21. Inspect backhoe daily for loosened, bent, or broken parts.
22. Engage transport locking pins before transporting or servicing backhoe.
23. Be sure tractor is weighted to provide at least 20% of total weight on front wheels with backhoe in transport position.

0595-3176 SERVICE DECAL

24. At every 50 hours of backhoe operation, replace hardware that secures the swing chains to the swing cylinder. Use 3/8” 16NC x 1 ¾” Grd. 8 bolts, torque to max. of 54 ft. lbs.

SAFETY DECALS

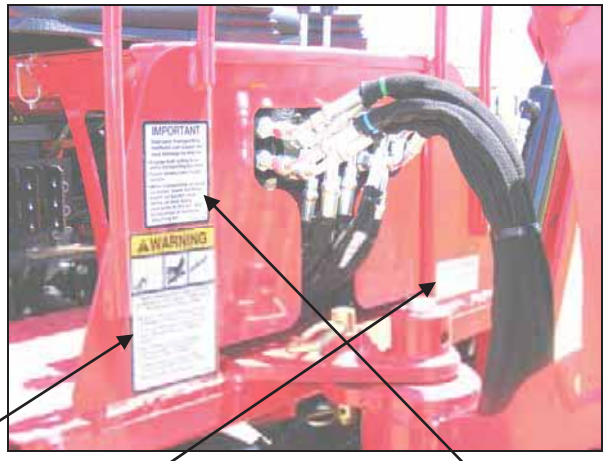
Safety Decal Locations

The safety of the operator was a prime consideration in the design of the backhoe. Proper shielding, convenient controls, simple adjustments, and other safety features have been built into this implement. The following decals are located on the backhoe. Keep decals clean and replace them immediately if they are missing. Contact your dealer or Mahindra for replacements.

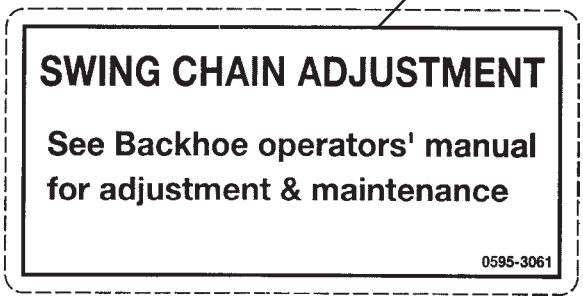
Care of Safety Decals

1. Keep safety decals clean and free of obstructing material.
2. Clean safety decals with soap and water and dry with a soft cloth.
3. Replace damaged or missing safety decals with new decals from your Mahindra Dealer.
4. If a component with a safety decal(s) affixed is replaced with a new part, make sure new safety decal(s) are attached in the same location(s) as the replaced components.
5. Mount new safety decals by applying on a clean dry surface and pressing air bubbles to outside edges.

WARNING
Raised backhoe boom, dipperstick and bucket can fall from hydraulic system failure. To avoid serious injury or death:
• Block up or securely support backhoe boom and dipperstick before working underneath.
• Do not use hand or skin to check for hydraulic leaks. Use cardboard or wood. Wear eye protection.
• High pressure oil leaks can penetrate skin causing serious injury and gangrene. Consult a physicain immediately.
• Lower backhoe to ground and release hydraulic pressure before loosening fittings.
• Refer to operator's manual for details.
0595-3065



IMPORTANT
Improper transporting methods can cause serious damage to tractor.
• Engage both safety locks when transporting backhoe.
• Travel slowly over rough terrain.
• When transporting on truck or trailer, Lower backhoe boom so bucket rests firmly on bed. Apply restraints to tractor, Not to backhoe or backhoe attaching kit.
0595-3064



SAFETY DECALS

CAUTION

TO AVOID SERIOUS INJURY OR DEATH

1. Read operator's manual before using backhoe.
2. Operate backhoe controls only from normal backhoe operator's seat position.
3. Operate only with stabilizers down and on firm footing. Avoid digging in area of stabilizer pads. Stay clear of steep areas or excavation banks that could give way.
4. Check the operating area to be dug for any possible overhead or underground lines such as electrical, gas, oil, water, etc. Extreme caution must be exercised in areas where these are present. Consult local utilities before digging.
5. Keep bystanders away from maximum swing reach area and stabilizers.
6. Keep all guards in place.
7. Inspect backhoe daily for loosened, bent, or broken parts.
8. Engage safety locks before transporting or servicing backhoe.
9. Be sure tractor is weighted to provide at least 20% of total weight on front wheels with backhoe in transport position.

0595-3067

SERVICE NOTE:
At every 50 hours of backhoe operation, replace the hardware that secures the swing chains to the swing cylinder. Use 3/8" 16NC x 1 3/4" Grd. 8 bolts, torque to max. of 54 ft. lbs.

0595-3176

WARNING

To avoid serious injury or death:
Do not operate this backhoe unless it is rigidly attached to the tractor using the appropriate factory - provided mounting kit.

0595-3063

SAFETY DECALS

⚠ CAUTION

Be sure to purge all the air from the hydraulic system before attempting to raise or lower this machine. Refer to operators manual for further details.

0595-3062

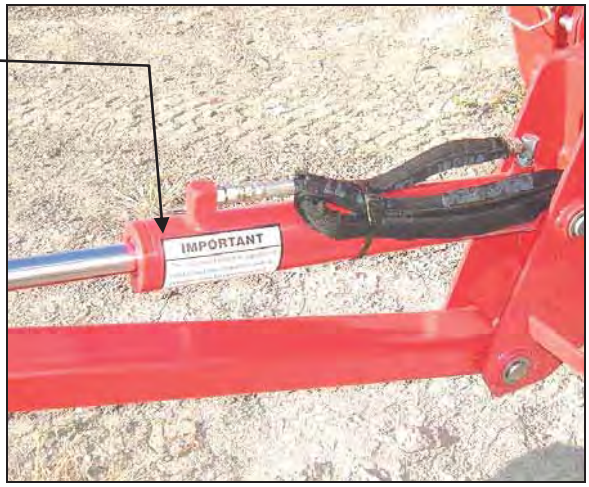
SAFETY DECALS

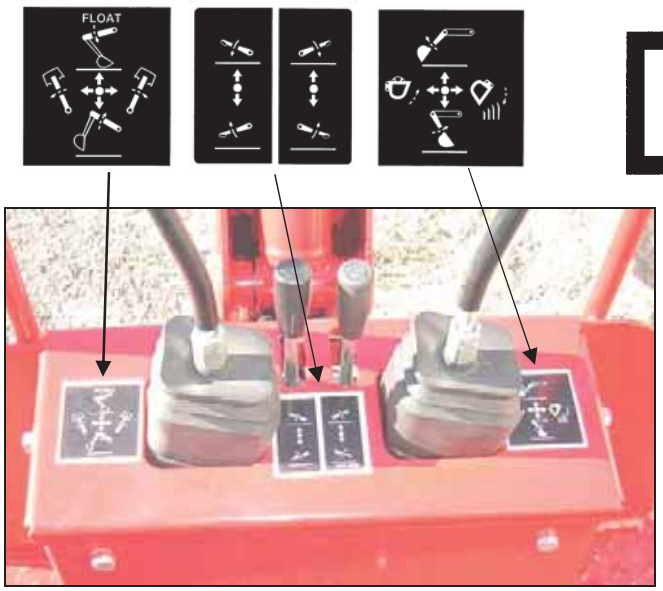
IMPORTANT

The backhoe bucket is capable of contacting this stabilizer and/or cylinder. Careful operation will avoid backhoe damage.

0595-3060

QTY. 2





PRESSURE **P**OWER **B**EYOND **T**ANK

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1. SPECIFICATIONS

1.1. Specification Details

- Dedicated hydraulic valve with dual plus axis levers.
- Formed console gives unit a modern appearance and allows improved comfort to operator.
- Double acting cylinders
  - Bucket = 2.25” cylinder
  - Lift = 2.50” cylinder
  - Dipper = 2.25” cylinder
  - Stabilizer = 2.50” cylinder
  - Swing = 2.75” cylinder
- Cushioned, orificed and port reliefs are designed into the swing cylinder circuit allowing for smooth operation of backhoe.
- Heavy duty swing frame.
- Backhoe valve is positioned low to operator. This allows less heat and noise to be transferred into operator’s area.
- Buckets are available in four sizes: 10”, 12”, 16", and 20”.
- Use only the following Buckets on 3715 Backhoe:

  10” 6702-1047 3715 and 1710 Backhoe Bucket
  12” 6702-1048 3715 and 1710 Backhoe Bucket
  16” 6702-1049 3715 and 1710 Backhoe Bucket
  20” 6702-1050 3715 and 1710 Backhoe Bucket
- SAE O-ring, Flat face O-ring, and JIC hydraulic connections are used on this unit to reduce potential hydraulic leaks.
- 4-Point mounting system. 3-point linkages must be removed with backhoe installed. When backhoe is parked 3-point components can be reinstalled.
- Quick on and off: pull two quick pins and back away. (See detailed instructions in this manual)
- High strength steel with double formed dipper assembly.
- High back comfortable seat.

ACCEPTABLE CYLINDER LEAK DOWN RATES

Cylinder	Cylinder Bore Size	Cylinder Outside Diameter	Leak Down Rate per 10 minutes	Loader Model Numbers
Bucket	2.0"	2.375"	2.84”	MB710
Dipper	2.25”	2.62”	2.05”	MB710
Lift	2.5”	2.87”	1.66”	MB710
Stabilizer	2.25”	2.625”	.76”	MB710
Bucket	2.25"	2.62"	2.22”	MB3710, MB3715
Dipper	2.25”	2.62”	2.22”	MB3710, MB3715
Lift	2.5”	2.87”	1.94”	MB3710, MB3715
Stabilizer	2.5”	2.87”	.62”	MB3710, MB3715

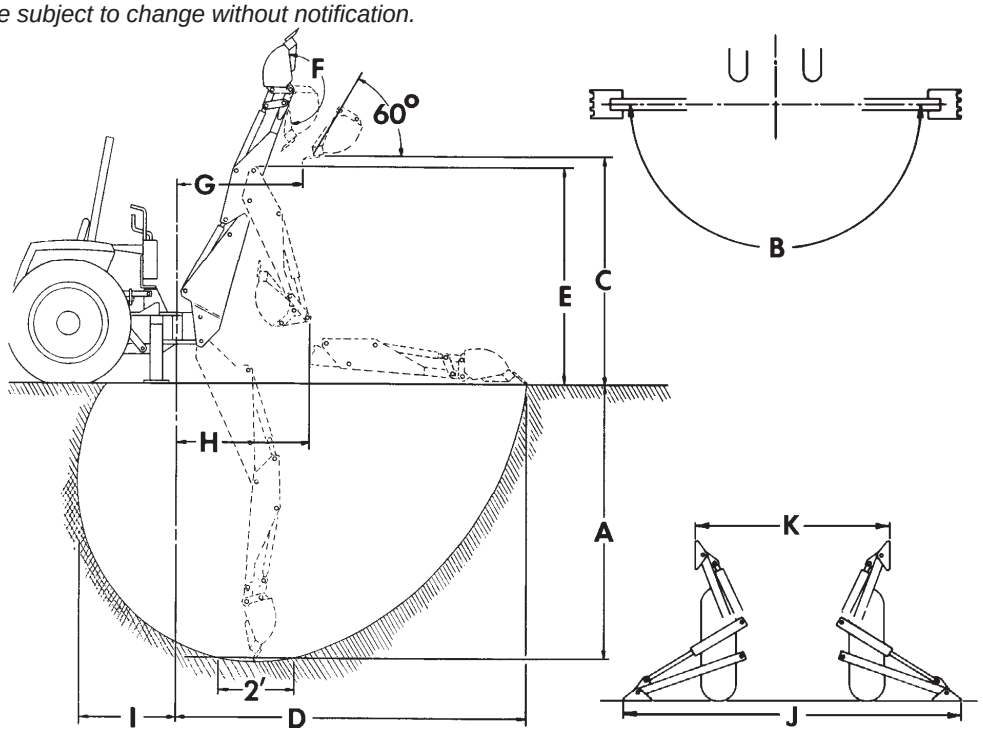
Leakage based on 120° Hydraulic Oil @ 1000 psi. If pressure or temperature is higher acceptable leak down rate will increase rapidly.

IMPORTANT: Leak Down tests must be done very accurately to make sure the results are accurate. Any valve that is returned and not found to exceed the manufacture's allowable leakage rate will not be covered under warranty.

IMPORTANT: Contamination in hydraulic system will cause damage to the loader valve which will increase valve spool leakage rates. If a returned valve is found to be damaged because of contamination it will not be covered under warranty. Keep your hydraulic system maintained at all times and make sure you clean all fittings and etc. when disconnecting or connecting hydraulic fittings.

1.2. Specifications

Following specifications are based on lower mounting bolt being 14" off of the ground. Specifications will vary depending on tractor model and wheel size it is equipped with. Specifications are provided for general use only. Specifications are subject to change without notification.



SERIES		3715
Maximum Digging Depth		94"
A.	Digging Depth (two foot flat bottom)	92"
B.	Swing Arc	180 degree
C.	Loading Height (bucket at 60°)	63"
D.	Reach from Center Line of Swing Pivot	127"
E.	Transport Height (maximum)	119"
F.	Bucket Rotation	175 degree
G.	Loading Reach (bucket at 60°)	51"
H.	Transport Overhang	44.7"
I.	Undercut	58"
J.	Stabilizer Spread, fully extended	101"
K.	Stabilizer Spread, up position	64.5"
Bucket Cylinder Digging Force		2900#
Dipper Cylinder Digging Force		1100#
Shipping Weight (less bucket)		1230#
Hydraulic Volume Requirements		
Hydraulic Pressure Requirements		2050psi
Recommended Tractor Models Requirements		3016 and 3616 ROPS Tractors

CAUTION: DO NOT operate backhoe without front loader and Roll Over Protection System (ROPS) mounted on tractor. Loader provides front ballast for better steering control and makes tractor/backhoe more stable during backhoe operation.

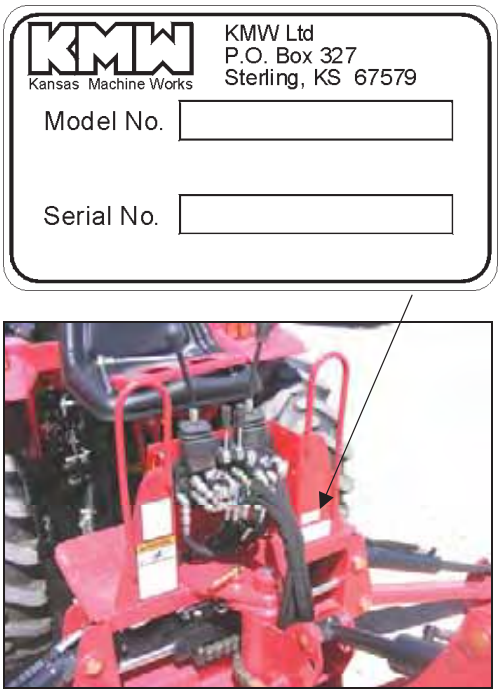
2. INTRODUCTION

This manual provides safety, installation, operation, maintenance, removing, storing, and reinstalling instructions for your new backhoe. Your backhoe has been designed to give many years of satisfactory service. Successful operation and long life of the backhoe depends, of course, on proper operation and care. Please read this manual carefully and follow the instructions. Correct operation and maintenance will save much time and expense.

OBSERVE and follow all CAUTION, WARNING, and DANGER instructions to help prevent serious injury and damage to the backhoe.

The reference to right hand (RH) and left hand (LH) used in this manual refers to the position when seated in the backhoe seat and facing toward backhoe.

If, at any time, you have a service problem with your backhoe or need new parts, contact your local Mahindra dealer. Your dealer will need the backhoe model number and serial number to give you prompt, efficient service. The serial number plate is located on left front hand side of backhoe.



Mahindra Backhoe Serial Number Information

BACKHOE SERIAL NUMBER_____

DATE PURCHASED_____

DEALER NAME_____

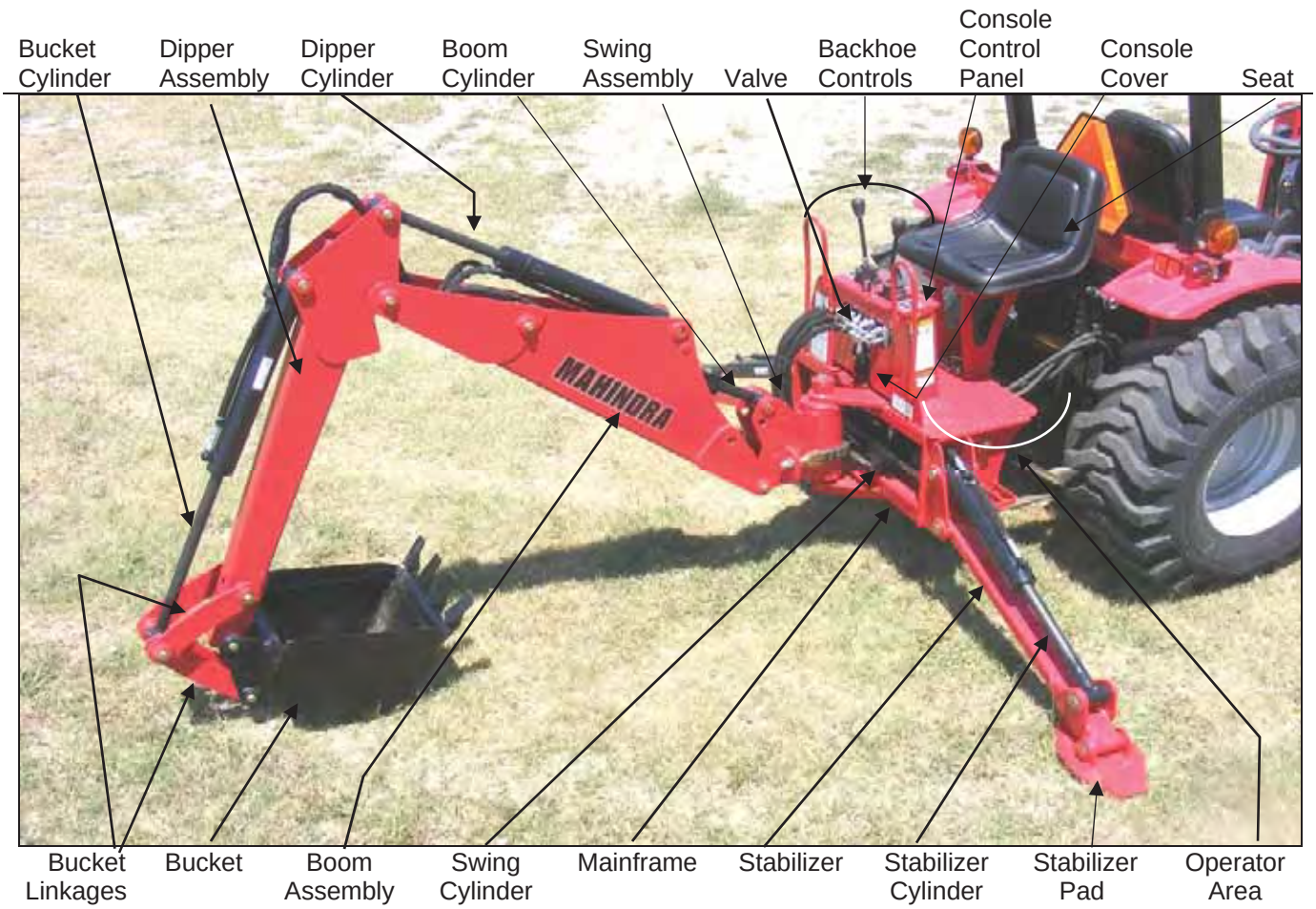
TELEPHONE NUMBER_____

3. BACKHOE COMPONENTS

Read entire instructions before beginning to install the backhoe. Serious injury and machine damage may be prevented if you read and understand these instructions and special safety messages.

3.1. Backhoe Components

Throughout this manual, reference is made to various backhoe components. The purpose of this page is to acquaint you with the various names of these components. This knowledge will be helpful when reading through this manual or when ordering service parts.



4. INSTALLATION INSTRUCTIONS ALL MODELS

CAUTION: DO NOT operate backhoe without front loader and Roll Over Protection System (ROPS) mounted on tractor. Loader provides front ballast for better steering control and makes tractor/backhoe more stable during backhoe operation.

Read entire instructions before beginning to install the loader. Serious injury and machine damage may be prevented if you read and understand these instructions and special safety messages.
When you are in the backhoe seat looking toward backhoe, the RH and LH sides of the backhoe are the same as your right hand and left hand.

4.1. Backhoe And Tractor Models

Model 3715 Backhoe is to be used on Mahindra 3016 and 3616 ROPS Tractors with ML115 or ML115SK loader installed.

4.2. Tractor Preparation-All Models

4.2.1. Tractor Tires
Use tires of equal size and maintain equal pressure in each tire. The pressure of the tractor tires must be increased to the maximum approved pressure recommended by the tire manufacturer to compensate for additional load placed on the tires with the front end loader and backhoe.

4.2.2. Tractor Ballast
The front end loader counterbalances tractor for maximum backhoe capacity and is required for safe backhoe operation. With front end loader installed, tractor maintains better traction and steering control and backhoe is more stable and efficient during operation.

IMPORTANT: Do not exceed the maximum load capacity of the tires on your tractor. See Tire and Wheel Specifications in tractor Operator Manual for more information.

4.2.3. Position the backhoe and tractor on hard level surface during backhoe installation.

4.2.4. Remove all backhoe, backhoe subframe/brackets, and misc. components from shipping packaging.

WARNING: To avoid serious injury or death: Read before cutting bands or removing attaching straps. The backhoe may shift during shipping and handling, making it unstable on the pallet. Support backhoe with an overhead hoist or other suitable means prior to removing bands or attaching straps securing backhoe to pallet. Failure to do so could result in accidental tip-over of backhoe that could cause serious injury to you and/or bystanders.

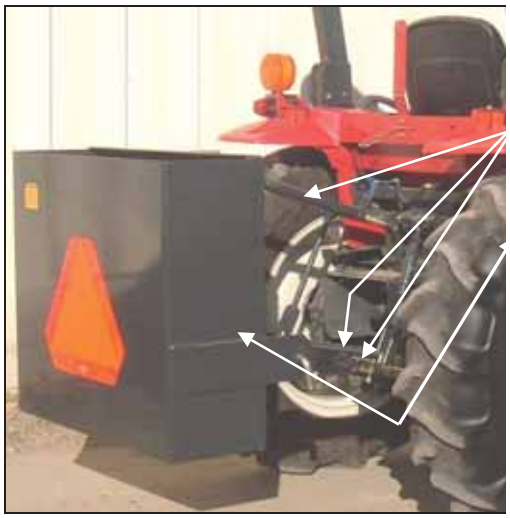
CAUTION: Lift and support all backhoe components safely.

4.2.5. 3715 on these tractor models 3016 and 3616:
Remove the following equipment:

- Rear hitch bracket.
- PTO Shield.
- 3-Point linkages.

Save rear hitch hardware so it can be used when installing new tractor/backhoe rear hitch assembly. Discard original tractor rear hitch bracket.

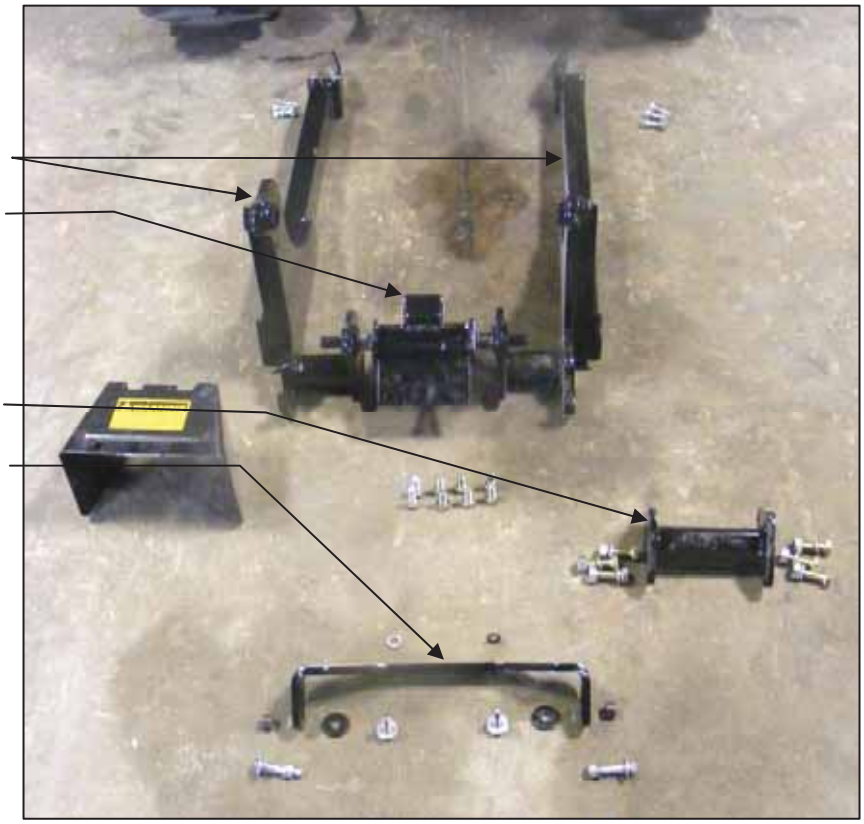
Note: When backhoe attachment is parked from tractor, reinstall loader rear ballast, drawbar, and 3-point upper and lower links to tractor before operating.

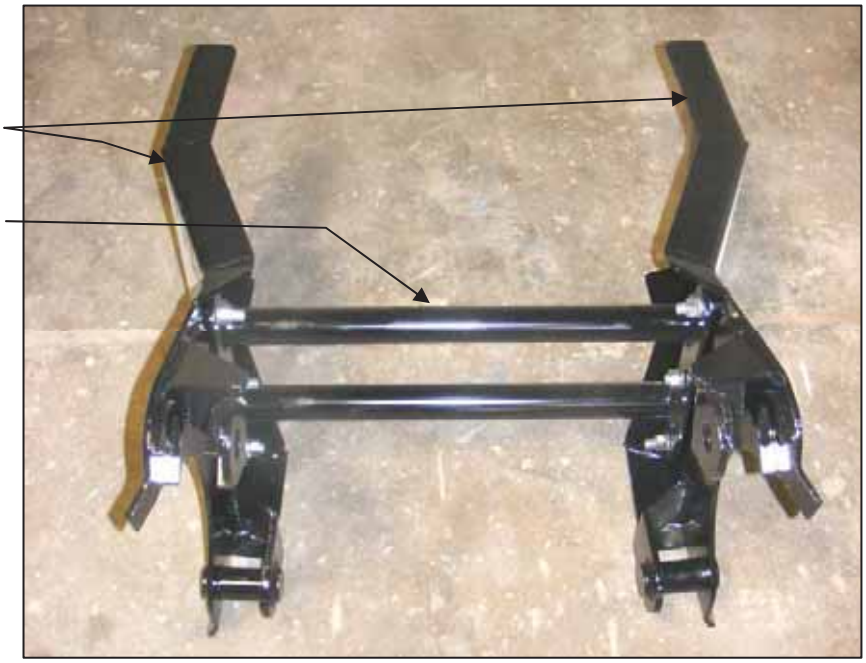


Tractor Model 3016 and 3616: Remove All 3-Point Components and Loader Rear Ballast.

INSTALLATION INSTRUCTIONS FOR BACKHOE MODEL 3715

4.2.6. Unpackage your backhoe subframe components and lay them out so they can be easily identified.

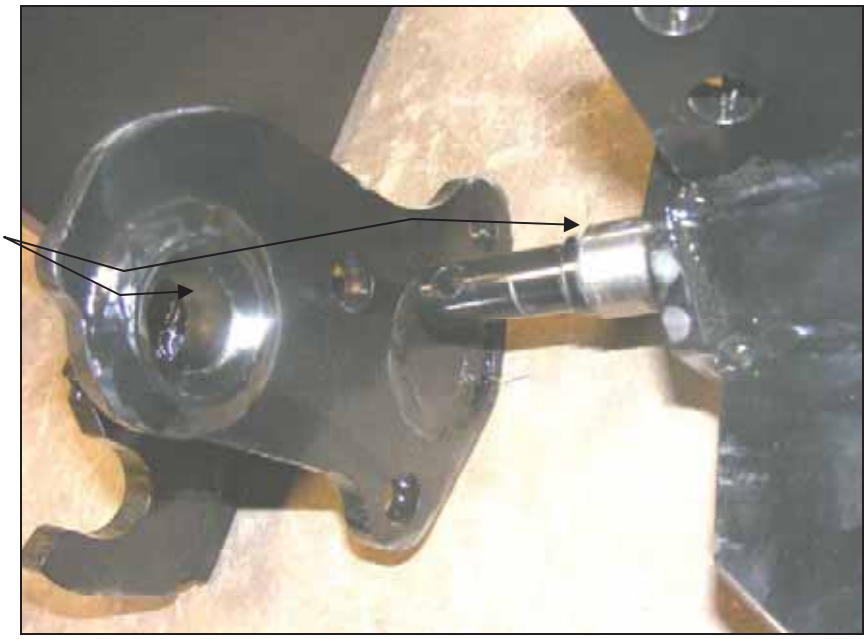




4.2.7. Check to make sure no paint is in the inside of the subframe bushings or on the rear hitch bracket pins in areas shown. If paint is on these surfaces remove before assembling components.

These surfaces must be clean of all paint before assembling, inside of bushing area and pin area as shown

NOTE: If removing Paint, DO NOT damage material surface of Pin or I.D. of Bushing.



4.2.8. Remove 3-point sway brackets from tractor. Save brackets and hardware so they can be reinstalled after the backhoe subframes are installed on the tractor.

To allow easier installation of Backhoe remove the RH and LH Sway Brackets

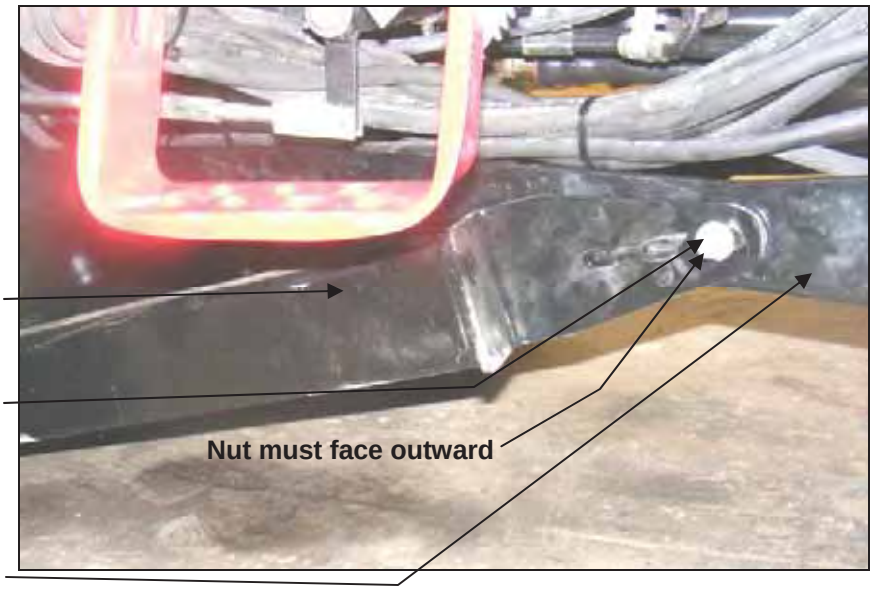
4.2.9. Install backhoe rear hitch bracket to RH and LH backhoe subframes by sliding pin into bushing.

Slide RH and LH Subframe Bushing onto the Rear Hitch Bracket Pin

4.2.10. Slide this assemble (RH and LH subframes and backhoe rear hitch bracket) under the tractor as shown.

NOTE: Only use Rear Hitch Bracket supplied with Backhoe. Never attach Backhoe to original Tractor Drawbar Hitch.

4.2.11. Raise the front of each of the backhoe subframes. Align front hole in subframes with front hole in loader rear rails. Install hex head cap screw ½”-13 x 1.75”, two hardened flatwashers, one on the inside of the loader rear rail and one on the outside of the backhoe subframe plate, ½” lockwasher and hex head nut ½”-13.


RH Backhoe Subrame
Hex Head Cap Screw ½”-13 x 1.75”, two Hardened Flatwashers, one on the Loader Rear Rail Side and one on the outside of the Backhoe Subframe Plate, ½” Lockwasher, Hex Head Nut ½”-13
Nut must face outward
Loader Rear Rail

4.2.12. Locate floor jack under rear hitch bracket as shown. Make sure the hitch bracket is positioned so the holes in the bottom of the hitch bracket will align with the mounting holes on the bottom side of the tractor.

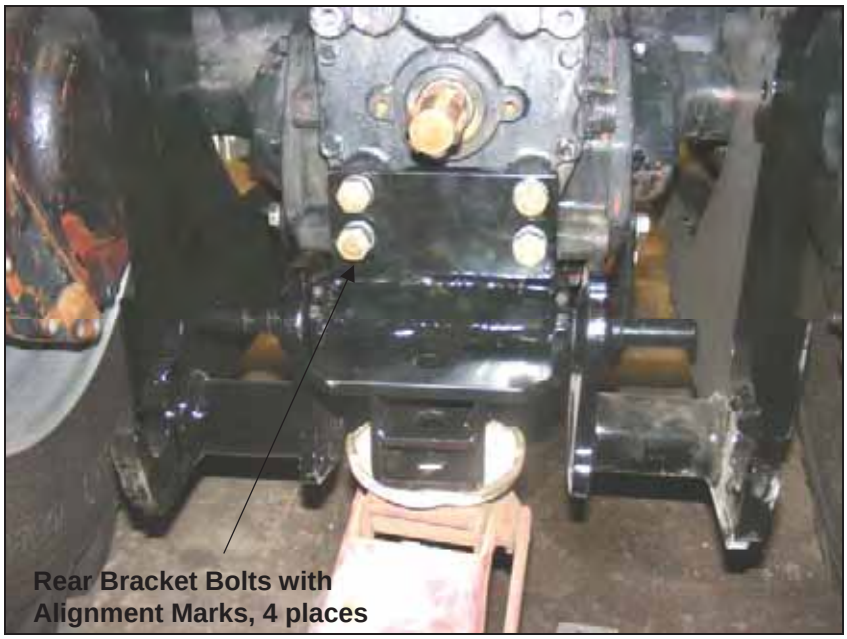
4.2.13. Clean all 8 rear bracket bolt threads and tractor drawbar internal casting holes with a degreaser, and allow threads to dry. After dry, apply 242/243 "Loctite" to both the bolt and internal casting threads. Reinstall bolts and torque to specifications noted in step 4.2.14.

CRITICAL NOTE: "Loctite" must be applied to BOTH the bolt threads and the internal casting holes of tractor to allow the "Loctite" to work properly. Hardware must be reinstalled and torqued as specified before "Loctite" begins to setup.

4.2.14. Raise subframe and align rear holes of hitch bracket with tractor casting holes. Using original tractor hardware, install rear hitch bracket to tractor using 4 rear bolts and 4 bottom bolts.

NOTE: When tightening the rear hitch bracket to the tractor, tighten all bolts equally so rear hitch bracket seats against the tractor casting evenly and completely.

Torque these bolts at this time to following specification
14mm bolts torque to 98 ft. lbs
12mm bolts torque to 68 ft. lbs



4.2.15. Place a mark on side of bolts and rear bracket with a permanent marker. This mark allows operator to have a quick visual check of hardware tightness.

4.2.16. Locate 3/16" spacer bushings behind upper crossbrace, then locate PTO guard and secure to tractor using hex head cap screw 12-1.75 x 45mm, ½" lockwasher and ½" flatwasher, 2 places as shown.

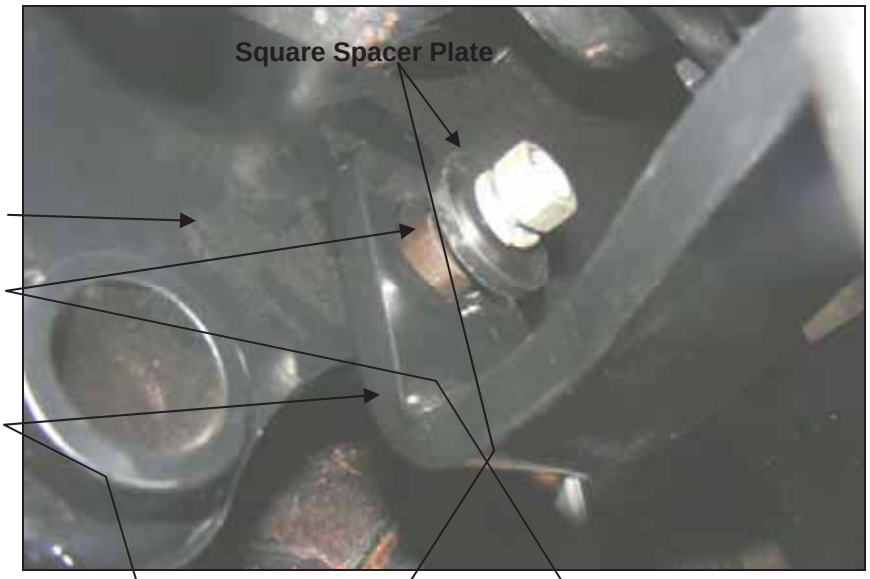
4.2.17. Install lower crossbrace to the RH and LH subframes using hex head cap screw 5/8”-11 x 2” grd. 8, 5/8” lockwasher and hex head nut 5/8”-11, 6 places.

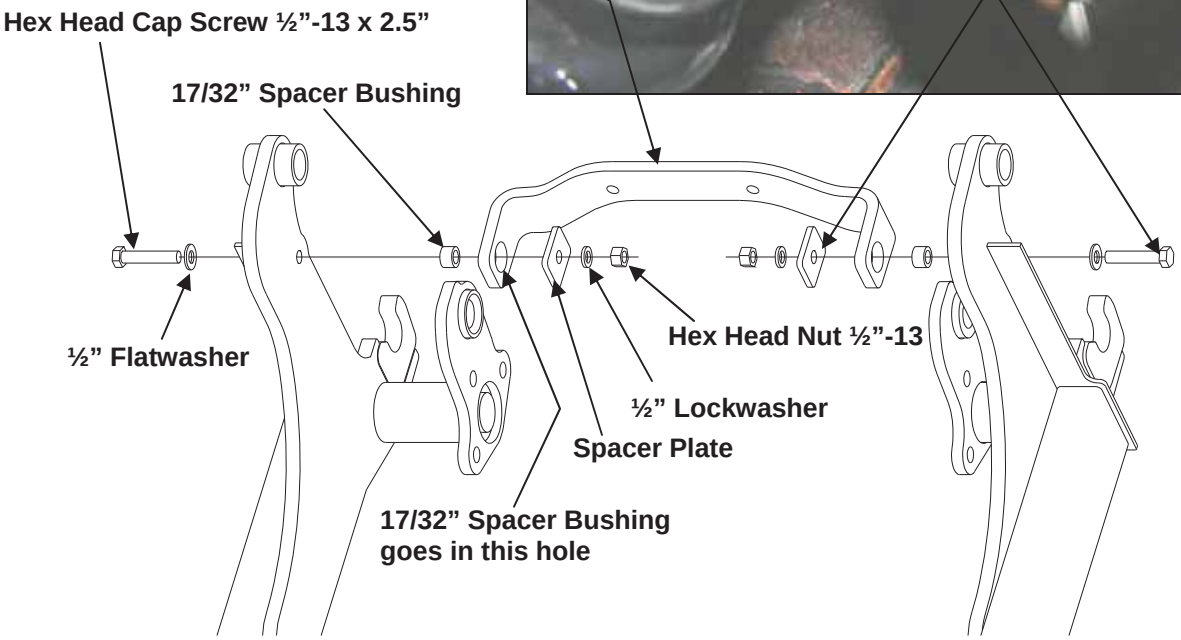
Lower Crossbrace Assembly

Hex Head Cap Screw 5/8”-11 x 2” grd. 8, 5/8” Lockwasher and Hex Head Nut 5/8”-11, 6 plcs

Do not tighten these bolts at this time.

4.2.18. Install hex head cap screw ½”-13 x 2.5”, ½” flatwasher, 17/32” spacer, ½” lockwasher, spacer plate and hex head nut ½”-13 to the upper crossbrace to the RH and LH subframes.


Square Spacer Plate
LH Subframe
Hex Head Cap Screw ½”-13 x 2.5”, ½” Flatwasher, 17/32” Spacer, ½” Lockwasher, Spacer Plate, Hex Head Nut ½”-13, install on LH and RH side
Upper Crossbrace



Note: 17/32” Spacer Bushing allows Top Crossbrace to float while holding RH and LH Subframes on center. Spacer must always be used in this location.

4.2.19. Install remainder of the hex head cap screw ½"-13 x 1.75", ½" hardened flatwashers on both side of bolt, ½" lockwasher and hex head nut ½"-13 that secure front of RH and LH subframes to the loader rear rails, 4 places.

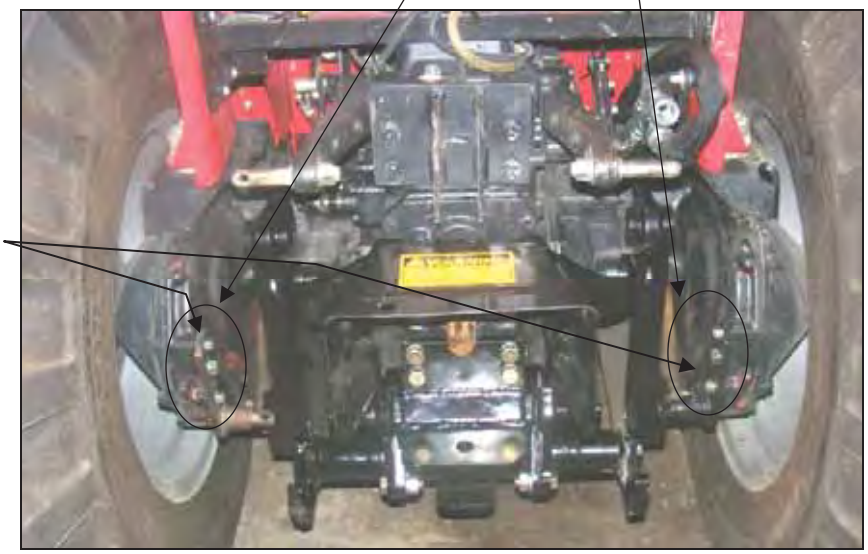
4.2.20. Torque all remaining backhoe subframe hardware as noted.

- 5/8"-11 Grd. 8 lower crossbrace hardware torque to 220 ft. lbs.
- ½"-13 Grd. 5 backhoe to loader rear rail torque to 80 - 96 ft. lbs.
- ½"-13 Grd. 5 hardware upper crossbrace to subframes torque to 80 - 96 ft. lbs.

4.2.21. Reinstall 3 point sway brackets to tractor as follows: Clean all tractor casting bolt threads and tractor drawbar internal casting holes with a degreaser, and allow threads to dry. After dry, apply 242/243 "Loctite" to both the bolt and internal casting threads. Reinstall bolts and torque to specifications. This step is required to keep this hardware tight during loader and backhoe operation.

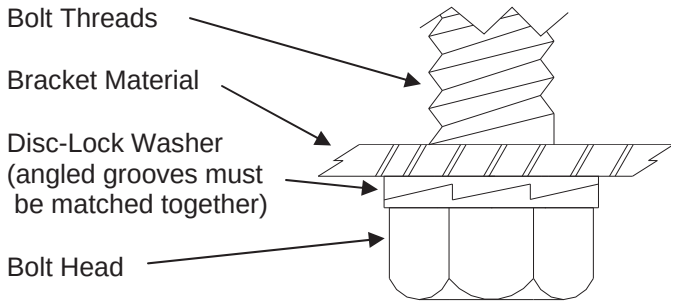
CRITICAL NOTE: "Loctite" must be applied to BOTH the bolt threads and the internal casting holes of tractor to allow the "Loctite" to work properly. Hardware must be reinstalled and torqued as specified before "Loctite" begins to setup.

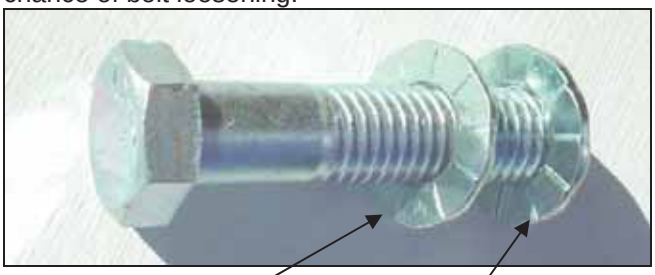
4.2.22. Reinstall tractor 3-point sway brackets to the tractor using tractor hareware. Torque the 12mm bolts to 68 ft. lbs. Torque the 14mm bolts to 98 ft. lbs.



4.2.23. Install subframe extension crossbrace to RH and LH backhoe subframe extension assemblies using hex head cap screw ½”-13 x 1.5”, ½” lockwasher and hex head nut ½”-13, 6 plcs as shown. DO NOT TIGHTEN THIS HARDWARE AT THIS TIME.

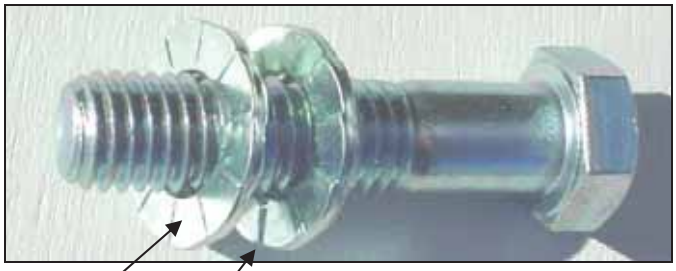
CRITICAL INFORMATION: To install the Disc-Lock Washer, simply mate the cams together and place between the bolt head and the bracket. As the bolt is tightened, one half of the Disc-Lock Washer is seated to bracket material and the other to the head of the bolt. When the bolt elongates due to vibration and shock, the bolt will attempt to rotate loose. As one half of the Disc-Lock Washer tries to rotate with the bolt, the interlocking cams work against each other. This will increase the preload, further locking the assembly and reducing the chance of bolt loosening.





Flat Grooves go toward bolt head

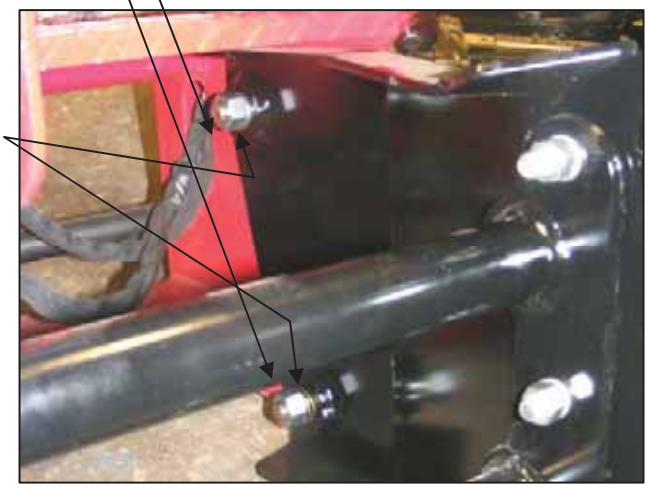
Angular Grooves must be matched together



Flat Grooves go toward bracket material

Angular Grooves must be matched

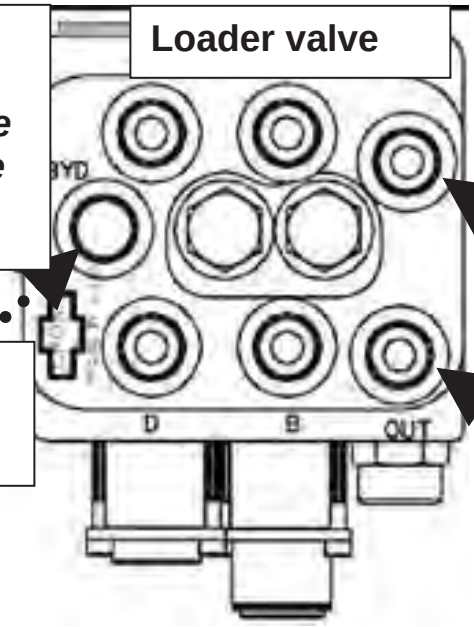
4.2.24. Install backhoe subframe extensions to backhoe using hex head cap screw ¾"-10 x 3.0" Grd.8, ¾" disc-lockwasher and hex head nut ¾"-10, 4 plcs. DO NOT TIGHTEN THIS HARDWARE AT THIS TIME.



HYDRAULIC INSTALLATION INSTRUCTIONS FOR BACKHOE MODEL 3715

General information on how to connect the hydraulic circuits of the ML115 loader, Backhoe and 3016/3616 tractors.

Loader valve

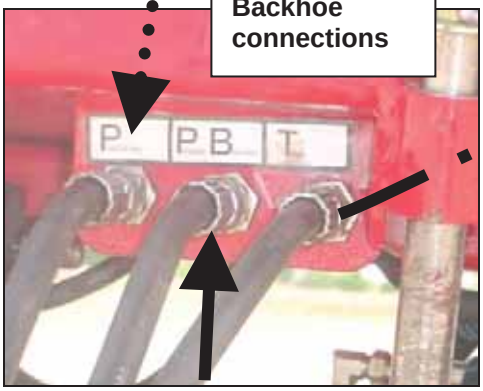


Loader hose same w/wo backhoe

Connect loader hose to the new hoses supplied with backhoe

Loader return hose Connect to tee

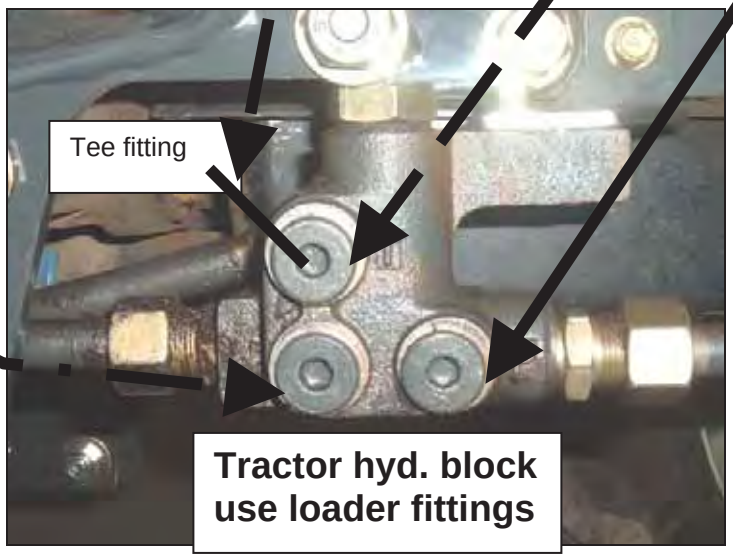
Backhoe connections



New hoses supplied with backhoe

New hoses supplied with backhoe

Tee fitting



Tractor hyd. block use loader fittings

See specific instructions for Fitting locations.

4.2.25. Disconnect loader return and power beyond hoses at the tractor hydraulic block. Install 9/16” JIC run tee to 90° loader fitting connect to return port of tractor block. Connect 9/16” JICM x JICF 90° fitting to tee fitting as shown.

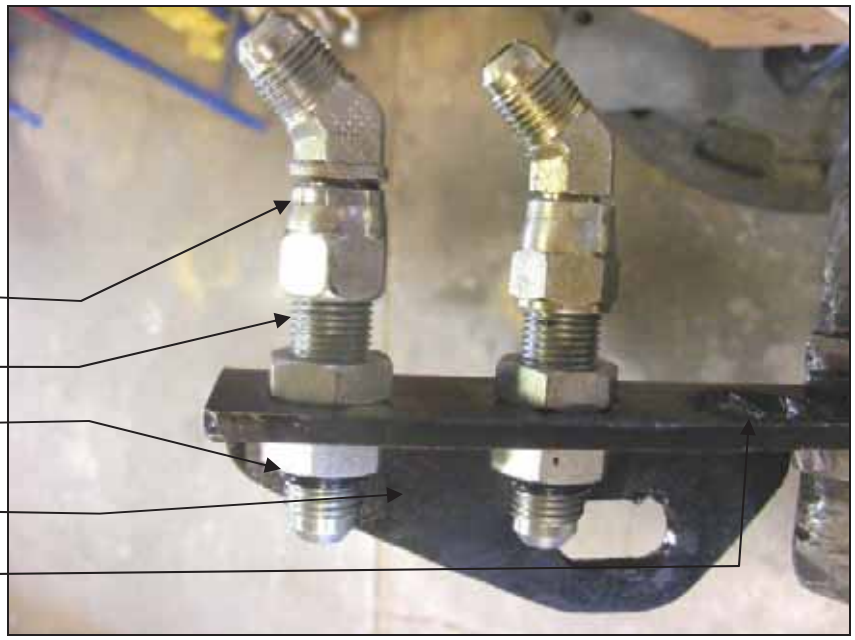
Loader Valve Return 90° fitting

Loader Power Beyond fitting

Return Line 9/16” JICM x 9/16” JICF 90° fitting. This connects to Loader Valve Return Hose

Return Line 9/16” JIC Run Tee fitting. This connects to Backhoe Return Hose

4.2.26. Install 9/16” JICM bulkhead fittings to quick coupler bracket as shown. Install o-ring to fixed side of bulkhead fittings and then install 9/16” JICF x 9/16” JICM 45° fitting to bulkhead fitting opposite end of the o-ring. Position 45° fittings as shown in this photo and following photos.



9/16” JICF x 9/16” JICM 45° fittings

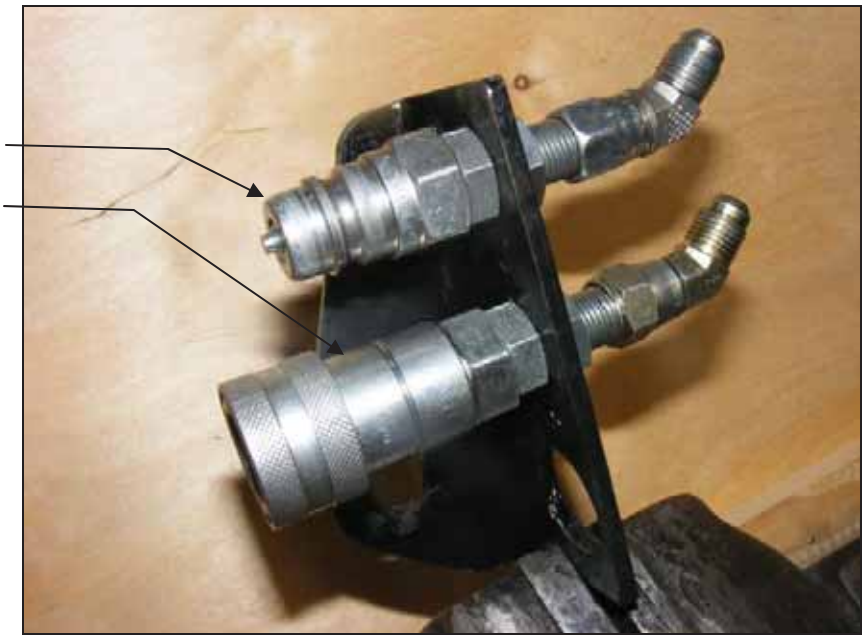
9/16” JICM Bulkhead fittings

O-rings installed on fixed side of Bulkhead fittings

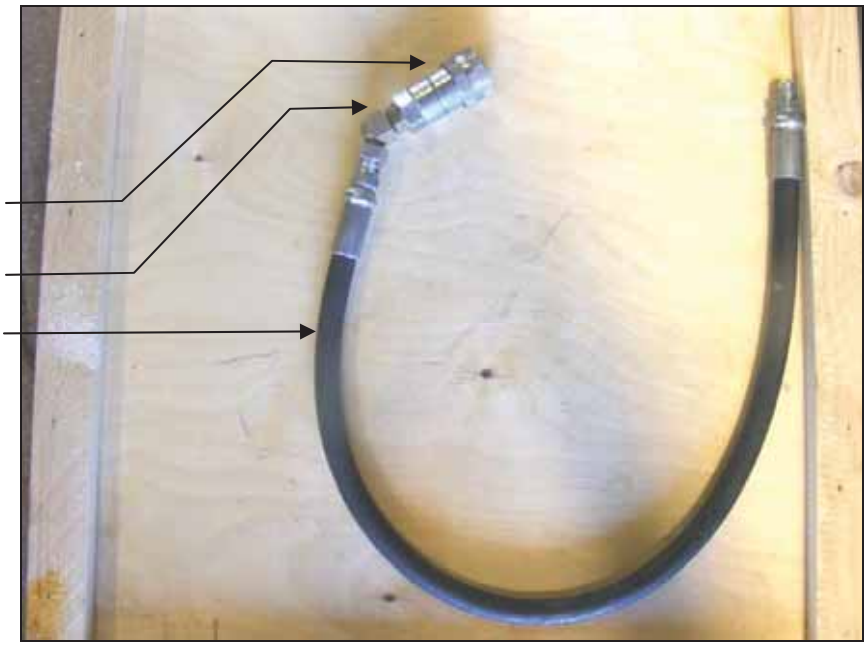
Quick Coupler Mount

1” diameter hole this location

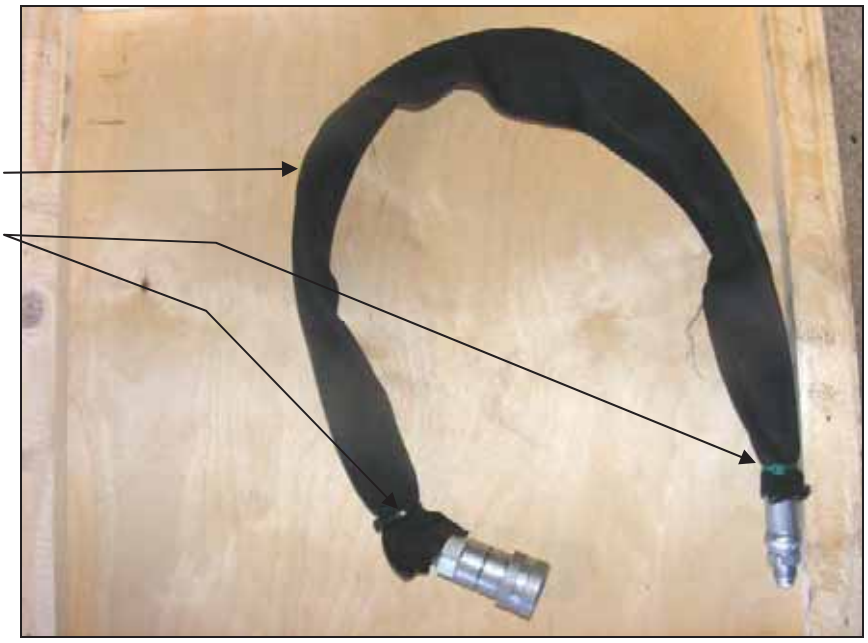
4.2.27. Install male and female quick couplers to bulkhead fittings as shown.



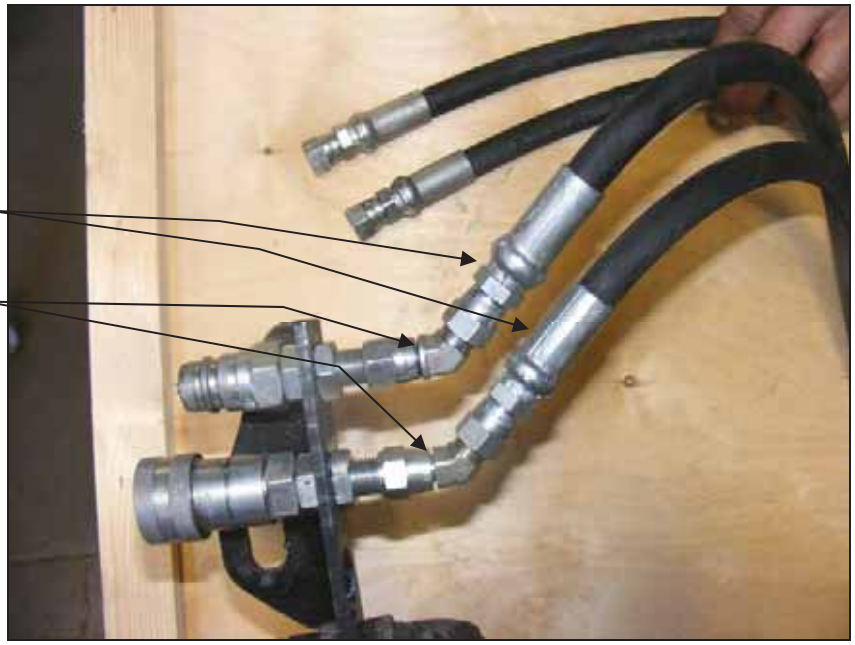
4.2.28. Connect 9/16” ORBM x 9/16” JICM 45° fitting to 9/16” JICF x 9/16” JICM x 3/8” x 29” hose. Install female quick coupler to this fitting.



4.2.29. Install 30” hose wrap to this hose secure both ends of how wrap using the smaller black nylon ties.



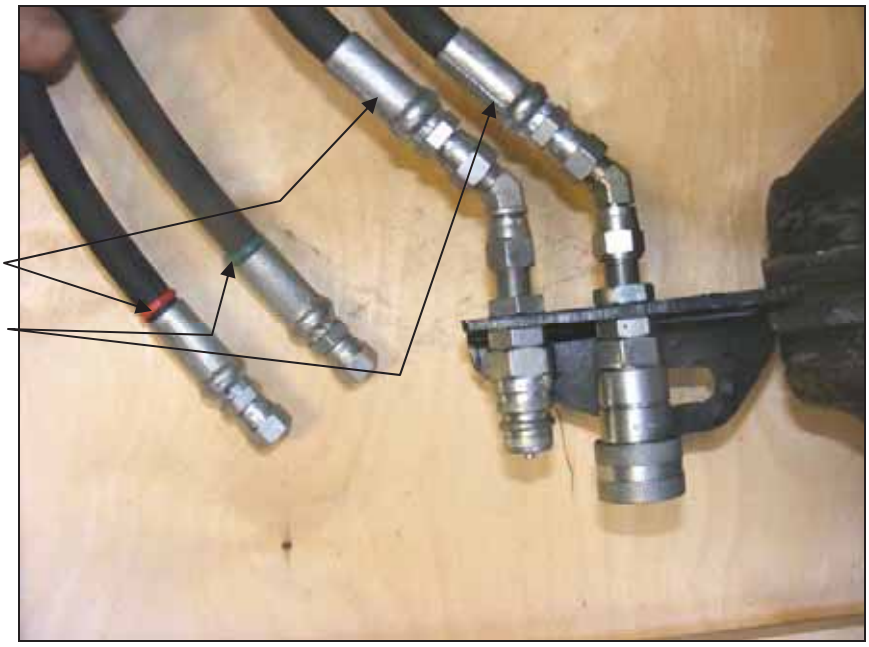
4.2.30. Connect 9/16” JICF x 9/16” JICF x 59” hoses to the 9/16” JICF x 9/16” JICM 45° fittings installed on the bulkhead fittings as shown.



4.2.31. Install green nylon tie on the 59" hose connected to the female quick coupler (this will be the return circuit from backhoe). Install red nylon tie on hose connected to male quick coupler (this will be connected to the power beyond port of tractor block).

Install Red Nylon Tie on this hose

Install Green Nylon Tie on this hose



4.2.32. Remove this tractor bolt and install a 12-1.25 x 50mm (Gr. 10.9 full thread bolt) in this location. Torque to 65 - 68 ft. lbs. Install ½" flatwasher, quick coupler mount with hoses and fittings, ½" flatwasher, ½" lockwasher and 12-1.25mm hex head nut. Refer to photo.

Remove this bolt and replace with 12-1.25 x 50mm Gr. 10.9 bolt

½" Flatwasher

12-1.25 Hex Head Nut, ½" Flatwasher each side of Quick Coupler Mount, ½" Lockwasher located under 12mm Nut

Quick Coupler Mount with Hoses and Fittings installed

45° Fitting rotated downwards

4.2.33. Route 29" with hose wrap through the top hole of the quick coupler bracket. Loop hose and connect the quick couplers together as shown.

29" Hose routed through Quick Coupler Mount

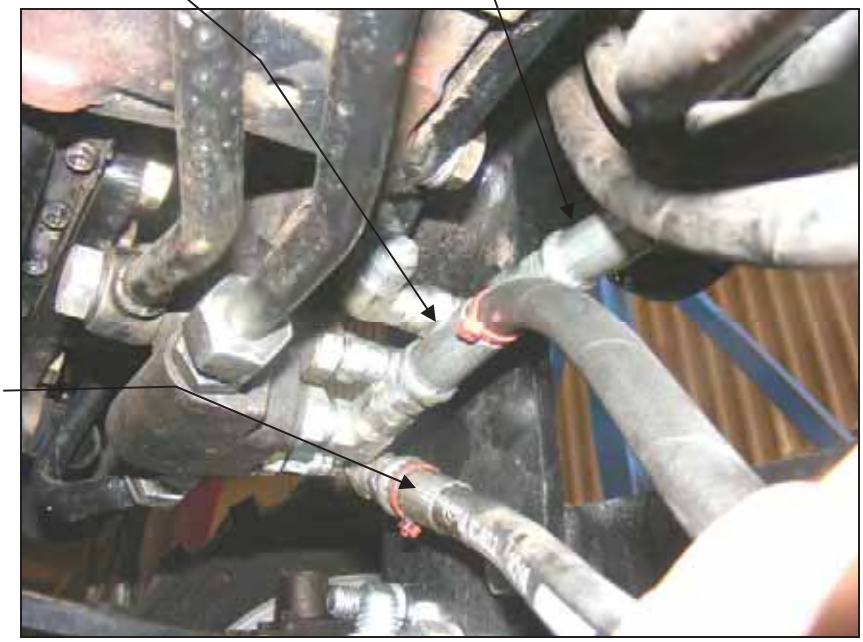
Quick Coupler Mount

Connect this Quick Coupler

4.2.34. Connect 59” hose marked with green nylon tie (return circuit) to tee fitting at tractor hydraulic block. Then connect the other 59” hose marked with red nylon tie (power beyond circuit) to power beyond fitting at tractor hydraulic block.

Connect Return Line from rear of Tractor (hose marked with Green Nylon Tie) to Tee fitting

Connect Power Beyond Line from rear of Tractor (hose marked with Red Nylon Tie) to Power Beyond fitting at Tractor Block



NOTE: This is the Pressure Line that connects from tractor Block to the Loader Valve

4.2.35. Connect the 29” hose from the rear of tractor to the power beyond hose that was connected from the loader valve to the tractor hydraulic block.

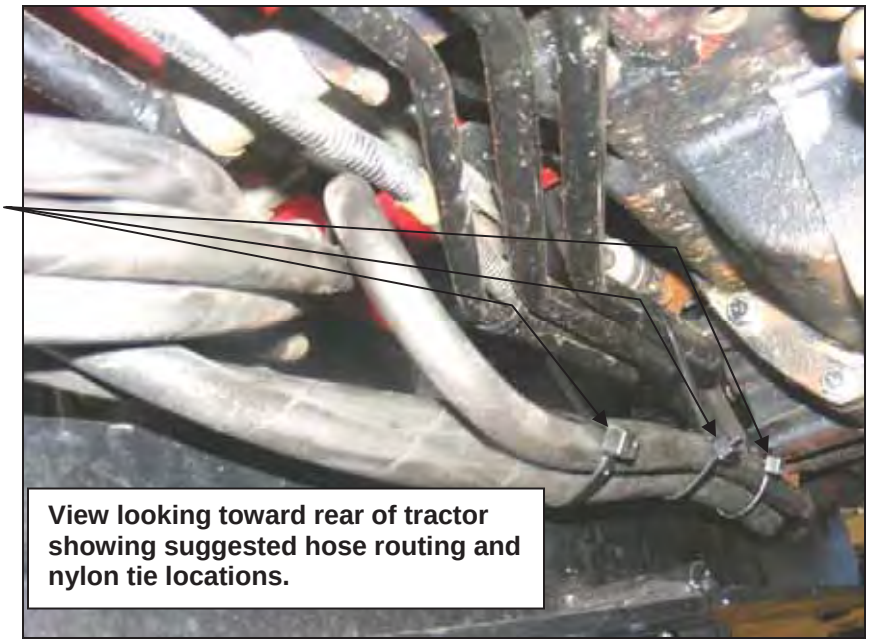
29” Hose from rear of Tractor

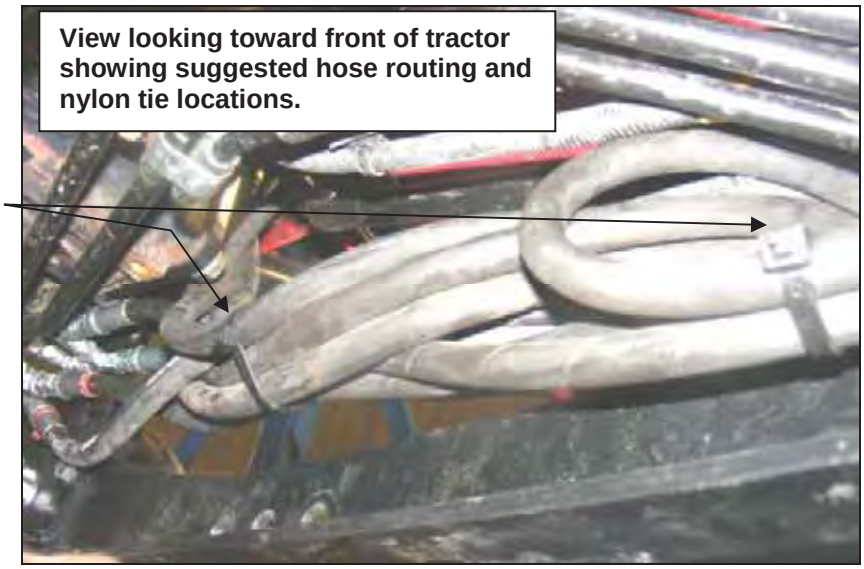
Connect these two Hoses at this point

Loader Hose removed from the Power Beyond fitting at the Tractor Hydraulic Block in Step 4.2.23

4.2.36. Connect the return hose from the loader valve to the 9/16” JICF x 9/16” JICM 90° fitting installed on the tee fitting at the tractor hydraulic block. This is the hose that was removed in step 4.2.23.

4.2.37. Secure all hoses to loader rear rails and tractor components so that they clear all tractor and loader components.


Secure hoses in areas shown
View looking toward rear of tractor showing suggested hose routing and nylon tie locations.


View looking toward front of tractor showing suggested hose routing and nylon tie locations.
Secure hoses in areas shown

4.2.38. Install 2 female quick couplers and 1 male coupler on the 36” hoses. Install red nylon tie on one of the hoses with the Male quick coupler on it. Locate nylon tie near quick coupler as shown.

4.2.39. Install these hoses to backhoe as follows:

The hose with the red nylon tie connects to the pressure fitting of the backhoe

The other hose with the male quick coupler must be connected to the tank fitting of the backhoe

Connect the remaining hose to the power beyond fitting at the backhoe

4.2.40. Install a red nylon tie to the top hose at the tractor. This will be connected to the pressure hose from the backhoe when backhoe is installed on tractor.

Install Red Nylon Tie

4.2.41. Using a hoist install backhoe to backhoe subframes attached to the tractor. Align bottom pin in subframe extensions with the lower hook on the backhoe subframes attached to the tractor. Then rotate the backhoe until the top attaching pin is aligned, secure using attaching pins and snap pins. See mounting and dismounting instructions for further information on how to connect backhoe to the backhoe subframes installed on the tractor.

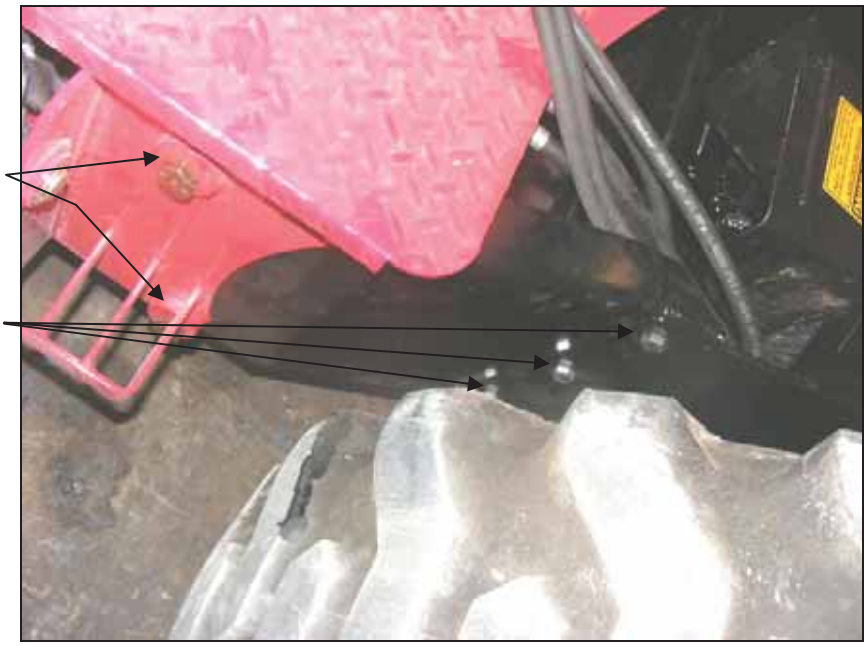
Rotate and align top pin point and then install Backhoe Quick Attach Pins

Lower pin installed in lower hook of backhoe subframe attached to tractor

4.2.42. Tighten ½”-13 extension crossbrace bolts and ¾”-10 bolts connecting backhoe to backhoe subframe extensions.

Torque ¾”-10 hardware to 380 ft. lbs

Torque ½”-13 hardware to 80 - 96 ft. lbs



4.2.43. Disconnect hoist then connect hydraulic hoses from backhoe to tractor as shown.

4.2.44. Use a hoist to install bucket on backhoe. Secure using 1" x 7.4" pins and 1/4" x 2-1/4" hardware.

Buckets are available in four sizes: 10”, 12”, 16", and 20”.

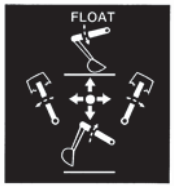
Use only the following Buckets on 3715 Backhoe:

10” 6702-1047 3715 and 1710 Bucket
12” 6702-1048 3715 and 1710 Bucket
16” 6702-1049 3715 and 1710 Bucket
20” 6702-1050 3715 and 1710 Bucket

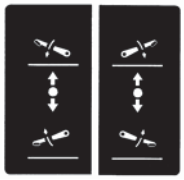
5. CONTROLS

The backhoe has two single lever controls plus two stabilizer control levers, located on the console control panel directly ahead of the operator. Following is a list of the controls from left to right, with the function of each.
NOTE: You will find some functions will not work when operating simultaneous operations. If this occurs, move lever to center and operate functions individually.

NOTE: You will hear some noise coming from the valve whenever a port relief opens. This noise is normal during backhoe operations.



5.1



5.2 **5.3**

5.4

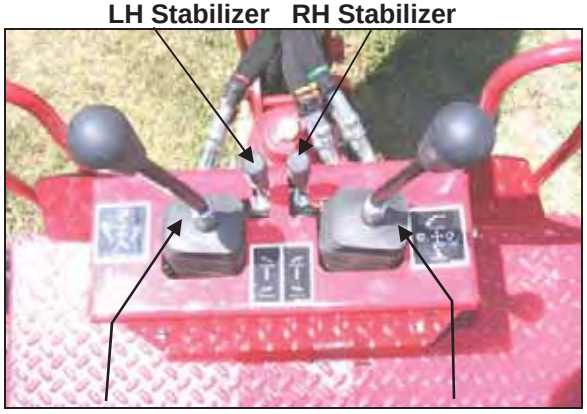
5.1. Boom & Swing:

Push lever forward, boom moves down, away from operator.
Pull lever back, boom moves up, toward operator.

The Boom/Swing Control Lever has an added “float” function. A detent or stop should be felt when the lever is pushed forward to move the boom down. Pushing the lever forward more will overcome the detent and cause the boom to float, or move down or up freely, depending on the forces acting on it. When the lever is released it should return to the center, neutral position.

Move lever to the left, backhoe swings to the left.
Move lever to the right, backhoe swings to the right.
By moving the lever to one of the intermediate positions, the boom can be swung left or right at the same time as the boom is being raised or lowered, performing two operations simultaneously.

LH Stabilizer **RH Stabilizer**



Boom & Swing **Crowd & Bucket**

SWING LEFT AND LOWER the boom by moving the control lever forward and to the left.
SWING LEFT AND RAISE the boom by moving the control lever back and to the left.
SWING RIGHT AND LOWER the boom by moving the control lever forward and to the right.
SWING RIGHT AND RAISE the boom by moving the control lever back and to the right.

5.2. Left Hand Stabilizer:

Push lever forward, the LH stabilizer lowers.
Pull lever backward, the LH stabilizer raises.

5.3. Right Hand Stabilizer:

Push lever forward, the RH stabilizer lowers.
Pull lever backward, the RH stabilizer raises.

5.4. Crowd & Bucket:

Push lever forward, the dipper assembly moves out, away from the operator.
Pull lever back, the dipper assembly moves in, toward the operator.
Move lever to the left, the bucket curls in.
Move lever to the right, the bucket extends out.

By moving the lever to one of the intermediate positions, the dipper assembly can be extended or retracted at the same time as the bucket is being loaded or dumped, performing the two operations simultaneously.

EXTEND AND LOAD the bucket by moving the control lever forward and to the left.
RETRACT AND LOAD the bucket by moving the control lever back and to the left.
EXTEND AND DUMP the bucket by moving the control lever forward and to the right.
RETRACT AND DUMP the bucket by moving the control lever back and to the right.

The two operations of the boom control lever, combined with the two operations performed by the bucket and dipper control lever, provide four simultaneous operations from the two levers, keeping cycle time to a minimum.

NOTE: You will find some functions will not work when operating simultaneous operations. If this occurs, move lever to center and operate functions individually.

In general, the direction of movement of a control lever corresponds to the movement of the operating member.

5.5. Operating the Backhoe

CAUTION: Equip your tractor with a ROPS frame for your protection. See your tractor/ROPS Operator Manual for correct seat belt usage.

1. Disengage transport locking pins before attempting to operate the backhoe. Store transport locking pins in holes provided in operator platform.

2. Operate from the backhoe operator's seat only.

3. Lower the stabilizers until the rear of the tractor is totally supported by them note: rear tires should not come up off of the ground.

4. Do not dig near the stabilizers.

5. Do not touch overhead wires with any part of the backhoe.

6. Do not attempt to raise the tractor off the ground or move the tractor forward or backward using the backhoe dipper assembly or bucket.

7. Do not lose stability by swinging the bucket downhill when positioned on a slope.

8. Do not lower the backhoe boom using the "float" function. It will freefall, and could result in serious injury to bystanders or damage to the backhoe.

It is not difficult to become an efficient operator. Control lever operating decals are located on the valve cover plate assembly. Study these decals. They will assist you in becoming familiar with the controls.

Smooth, light handling of the controls will result in the most efficient backhoe operation.

Operate the backhoe control levers to become familiar with their speed and movements. The engine speed and the size of the hydraulic system will determine the speed of cylinder operation. When powering from tractor systems with higher output than required, reduce engine RPM to obtain acceptable backhoe operating speed.

Swing the boom several times to practice controlling the speed of swing. Do not operate the swing more than 45 degrees each way for the first few times, then gradually increase the arc.

The boom "float" function may be used during digging to eliminate down pressure when cleaning the bottom of a trench. The primary purpose of the boom "float" function is to protect the operator from serious injury in the event that some component of the backhoe would fail.

Best results are obtained by digging near the center of the swing arc so material can be dumped on either side.

As the operator becomes more familiar with the operation of the backhoe, it will be common practice to operate two controls at one time. For example, with the bucket extended and the dipper assembly extended, the boom control and crowd control can be operated together to bring the bucket toward the operator with down pressure on it. As the dipper assembly approaches the operator, the crowd and bucket controls can be operated to close the bucket and trap the material. At the end of the stroke, the boom and crowd controls are operated to move the load up and away from the operator to save time in clearing the excavation.

This dual operation of controls will speed and simplify the digging operation. Normally the two or more movements will not be equal or even simultaneous, but as the pressure within the cylinders changes, and the resistance on an operating member of the hoe lessens, it will begin to move. It is balancing the force of one member against the other.

NOTE: Actuating the bucket is the key to powerful digging. Operating the crowd and bucket controls simultaneously will insure a full bucket and prevent waste motion and time.

NOTE: If any handle begins to develop excessive play, or becomes misaligned in neutral or center position, it is an indication that control handle or linkages have become loose or worn. Replace or repair immediately.

WARNING: Never adjust main valve relief or any port reliefs in backhoe valve. Failure to follow these instructions can cause cylinder and/or backhoe frame damage that could result in personal injury.

6. TRANSPORTING BACKHOE

6.1. Transporting Backhoe on Tractor

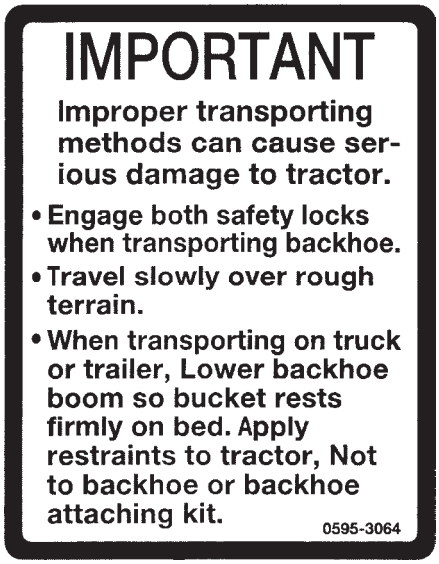
CAUTION: To avoid possible injury, observe the following safety rules:

1. Always install transport locking pins into transport position. Refer to page 46.
2. Travel slowly over rough terrain, on hillsides, and around curves to prevent tipping.
3. Do not drive the tractor near the edge of a ditch or excavation.
4. Use accessory lights and SMV emblem when traveling on highways.

IMPORTANT: To prevent serious damage to the tractor, read and follow the instructions on decal shown at right:

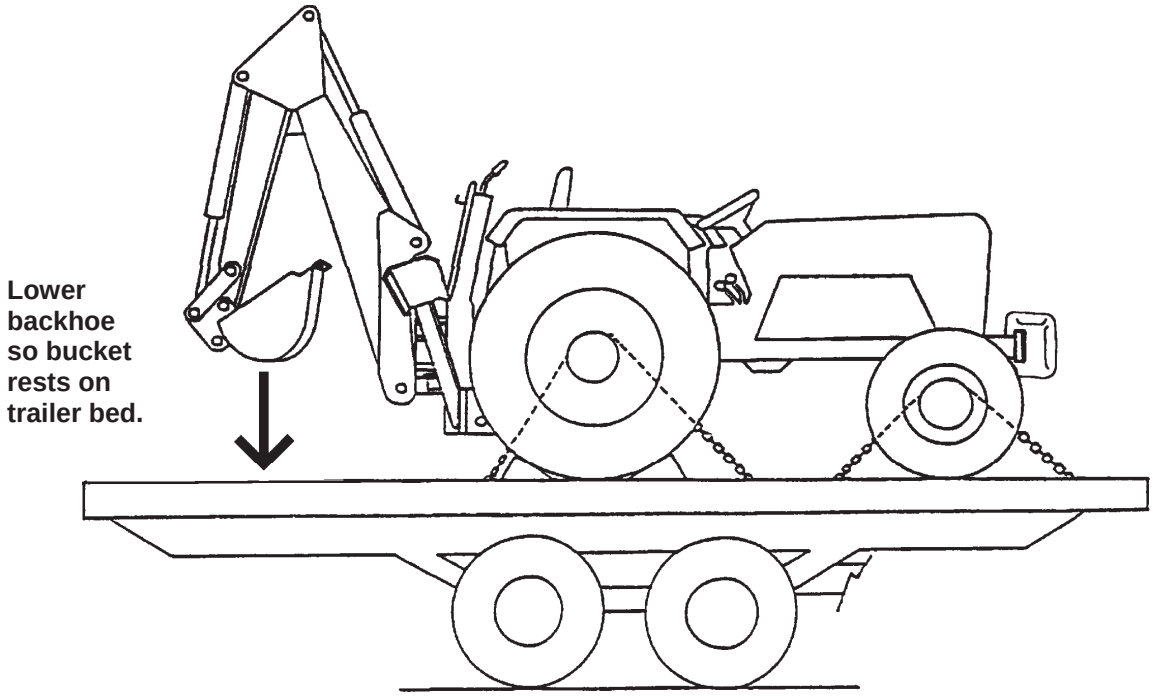
6.1.1. Before leaving backhoe operator's seat, position the backhoe for transport by raising boom assembly, crowding dipper assembly in, swinging to center and raising the stabilizers.

IMPORTANT: When transporting for long distances, periodically examine the backhoe and raise stabilizers and bucket back up to the full transport height. It is normal for the backhoe to slowly settle while being transported.


IMPORTANT
Improper transporting methods can cause serious damage to tractor.
• Engage both safety locks when transporting backhoe.
• Travel slowly over rough terrain.
• When transporting on truck or trailer, Lower backhoe boom so bucket rests firmly on bed. Apply restraints to tractor, Not to backhoe or backhoe attaching kit.
0595-3064

6.2. Transporting Backhoe and Tractor on Truck or Trailer

CAUTION: Do not attach hold down chains to backhoe in order to secure tractor to trailer. Block and secure tractor only. Bucket should be lowered to bed when possible.



6.3. Transport Locking Pins

CAUTION: Always install transport locking pins into transport position when transporting or storing unit. This will prevent accidental movement of unit.

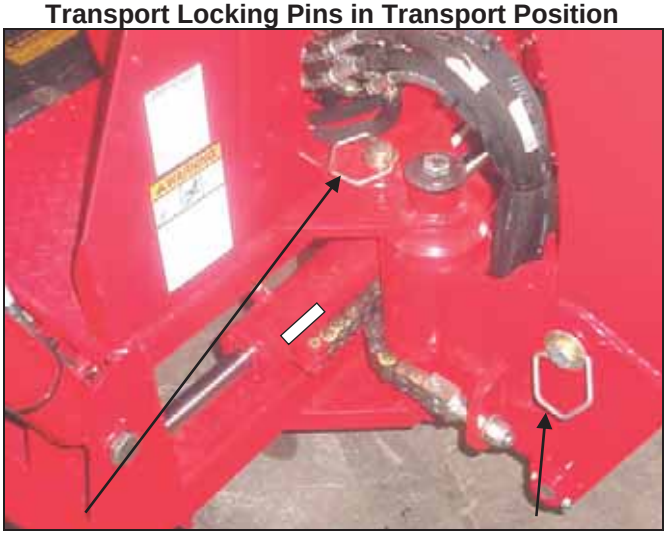
CAUTION: Always remove transport locking pins from transport position before attempting to operate the backhoe.

6.3.1. Position backhoe in transport position as follows:

- Raise boom assembly all the way up by retracting boom cylinder.
- Curl bucket back into dipper assembly by extending the bucket cylinder.
- Retract dipper assembly by extending the dipper cylinder.
- Center backhoe by operating the swing cylinder.
- Remove the transport locking pins from the storage position.
- Install the transport locking pins in the transport position and secure with snap pins provided.

IMPORTANT: To prevent damage to backhoe boom assembly, always curl bucket back into dipper assembly by extending bucket cylinder with dipper assembly extended slightly. Then retract dipper assembly by extending dipper cylinder. Do this in reverse when getting ready to operate backhoe. This procedure is required to prevent bucket teeth from contacting boom assembly when folding and unfolding backhoe.

Transport Locking Pins in Transport Position

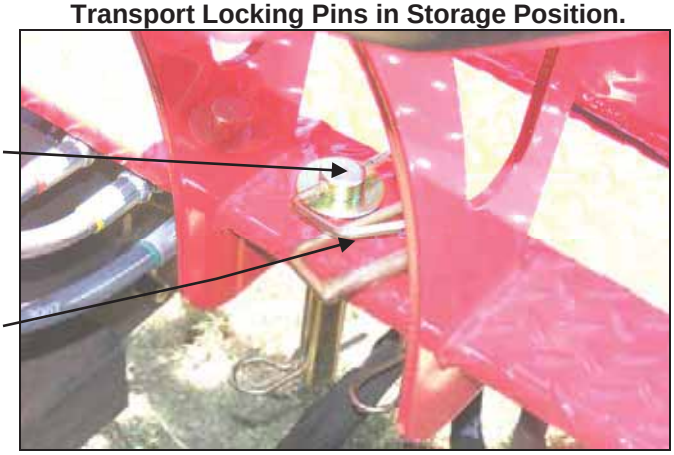


Swing Transport Locking Pin in Transport Position.

Boom Transport Locking Pin in Transport Position.

6.3.2. Place transport locking pins in storage position during backhoe operation and secure using locking pins provided.

Transport Locking Pins in Storage Position.



Boom Transport Locking Pin in Storage Position

Swing Transport Locking Pin in Storage Position

7. GENERAL OPERATION

CAUTION: To avoid possible injury, observe the following safety rules before operating the backhoe:

1. Be sure area is clear of underground utilities or other hazards.
2. Position barricade around work area.
3. Provide adequate front end weight to counter-balance tractor at all times. 20% minimum of the total tractor, loader and backhoe weight must be on the tractor front axle.
4. Keep bystanders a safe distance away.
5. While operating backhoe, keep your body in operator's area only. Do not place any part of your body in front of console area. Failure to follow these instructions could cause operator to be injured

CAUTION: DO NOT operate backhoe without front loader and Roll Over Protection System (ROPS) mounted on tractor. Loader provides front ballast for better steering control and makes tractor/backhoe more stable during backhoe operation.

DIRECTIONS: The terms right, left, front, and back shall be determined from the position of the operator when seated in the operating position on the backhoe looking toward backhoe.

IMPORTANT: To prevent damage to backhoe boom assembly, always curl bucket back into dipper assembly by extending bucket cylinder with dipper assembly extended slightly. Then retract dipper assembly by extending dipper cylinder. Do this in reverse when getting ready to operate backhoe. This procedure is required to prevent bucket teeth from contacting boom assembly when folding and unfolding backhoe.

7.1. Stabilizer Pads

The backhoe is supplied with flip-over stabilizer pads as standard equipment. They are suitable for most backhoe work and generally are all that is ever required.

IMPORTANT: The backhoe bucket is capable of contacting stabilizers and/or stabilizer cylinders. Careful operation will avoid backhoe damage. Damage to these components caused by operator are not covered under warranty.

IMPORTANT

The backhoe bucket is capable of contacting this stabilizer and/or cylinder. Careful operation will avoid backhoe damage.

0595-3060

7.2. Entering And Leaving Backhoe Operator Area

Operator must always enter and leave backhoe operator area using the area between tractor tire and backhoe stabilizer on either RH or LH side of the backhoe,

Operator must always use steps and hand rail for support while entering and leaving backhoe operators area. Do not use stabilizers as a step.

Following these instructions will allow the operator a safe means of entering and leaving backhoe operator area.

Handrail: Use handrail instead of control levers for support.

Steps: Located on each side of backhoe.

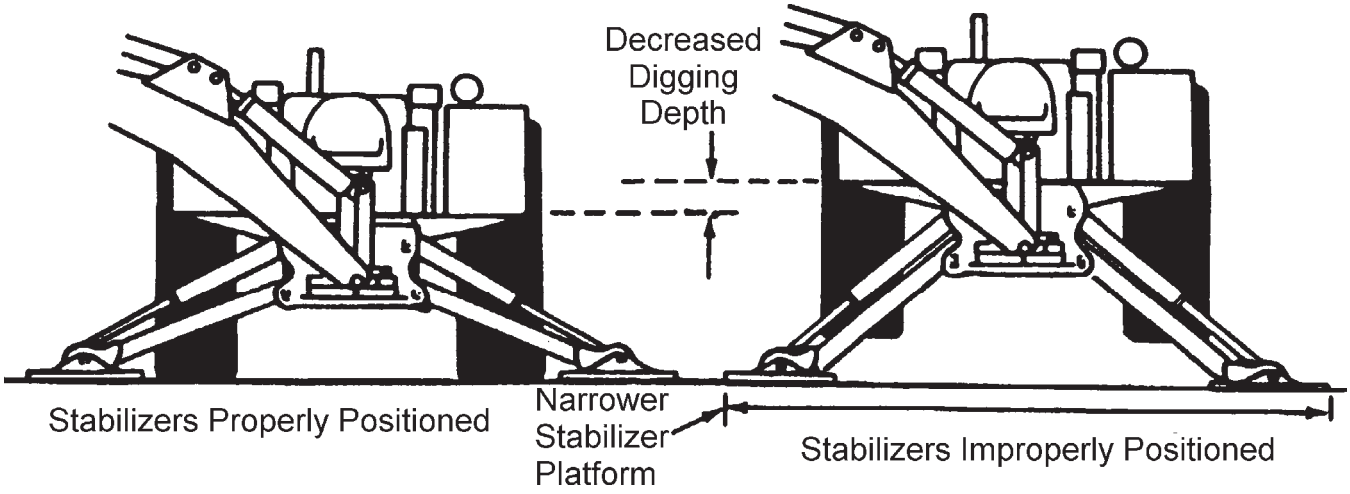
Operator must always enter and leave backhoe operator area using the area between tractor tire and backhoe stabilizer.

CAUTION: Never use backhoe control levers for a handhold. Accidental movement of backhoe could result in serious injury or death.

CAUTION: Do not use the stabilizers as a step. Use the steps and handrail when entering and leaving the operator console area. Failure to do so could cause a fall.

7.3. Placing the Backhoe Stabilizers for Digging

Set the stabilizers to remove weight from the rear tractor wheels. The wheels are to remain touching the ground as this provides for the widest stabilizer stance and the lowest center of gravity. Raising the wheels off the ground will not only reduce stability and digging depth, but also will impair performance and impose unnecessary stress on the unit.



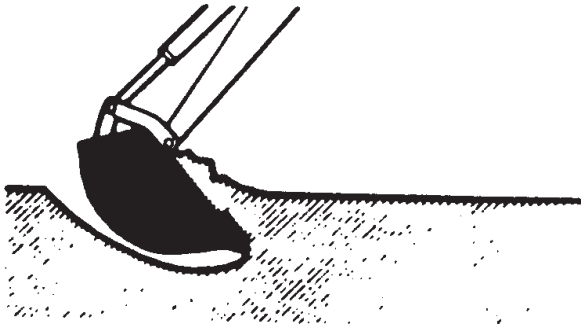
7.4. Engine Speed

The speed at which the backhoe operates is partially dependent on engine RPM. Use a moderate engine speed to start and increase it as your experience permits. When powering from tractor systems with higher output, reduce engine RPM to obtain acceptable backhoe operating speed.

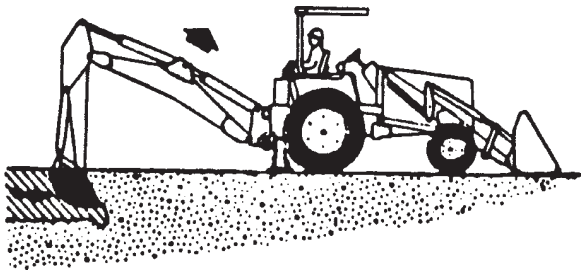
8. GENERAL OPERATION INSTRUCTIONS

8.1. Filling The Bucket

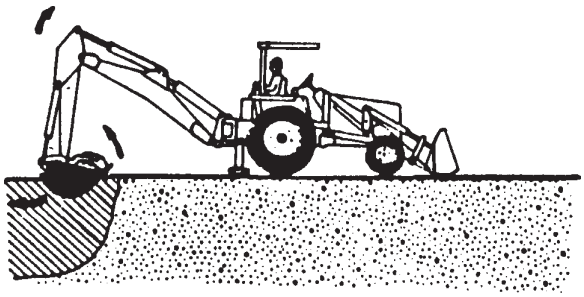
Control the bucket altitude throughout the digging cycle to keep teeth at the proper angle for best penetration. This will minimize dragging and scraping the bucket through the ground.



When digging in hard-packed soil, bucket penetration can be increased by applying down pressure with the boom while crowding in and curling the bucket. If the crowd action “stalls” it may be necessary to apply lift occasionally during the digging cycle to correct the bucket depth.



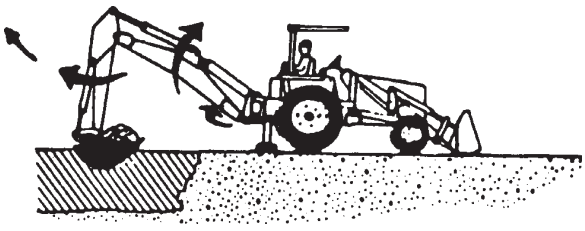
To obtain a cleaner trench and avoid the buildup of material directly in front of the backhoe, crowd out and completely curl the bucket while starting to lift it from the excavation. In this way, excess material will fall back into the excavation.



8.2. Dumping The Bucket

To dump the bucket at the end of the digging cycle, lift the bucket clear of the trench while crowding it out and swinging it to the spoil pile.

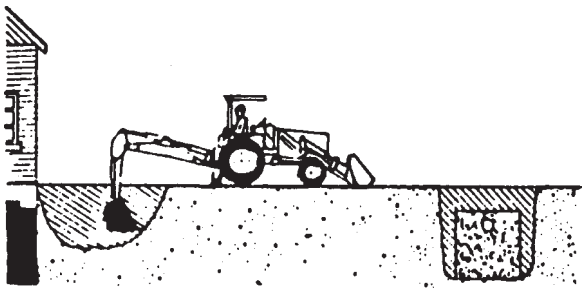
As the pile is approached, dump the bucket. When the bucket is empty, the dipper assembly and bucket are in position to resume digging upon return to the trench.



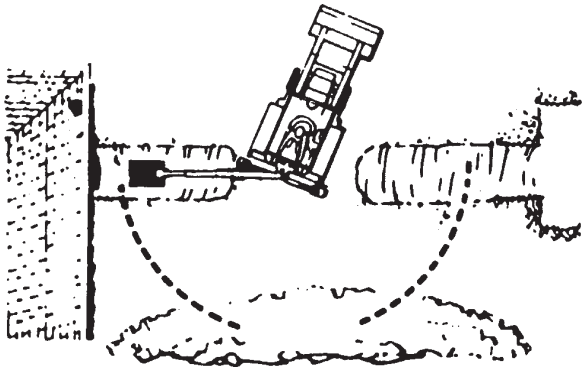
IMPORTANT: Avoid constant jarring or hammering-type contact between the spoil pile and the loaded bucket, as this may cause premature wear to the backhoe pins and bushings.

8.3. Trenching Between A Building And Open Excavations

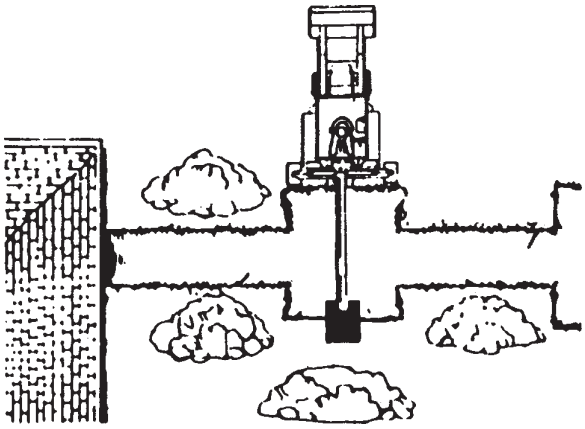
Start the trench at the building. Trench out halfway to the excavation. Then start trenching from the excavation to the first trench. Dig toward the first trench until there is just enough room to move the unit out between the two trenches.



Position the unit so the backhoe swing post is over the centerline of the trench connection. Dig with the backhoe at extreme swing positions, and in as close to the stabilizers as possible. Pile the spoil on the opposite side of the trenches.

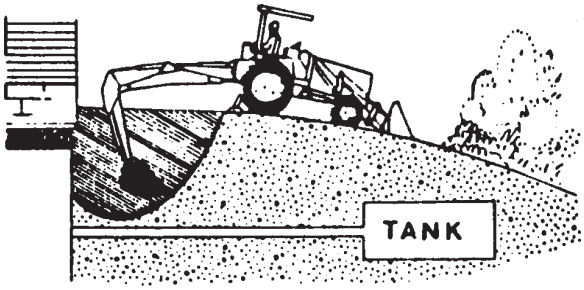


Position the unit forward with the boom and crowd controls so the two trenches can be connected. Pile the spoil on the opposite side of the trench.

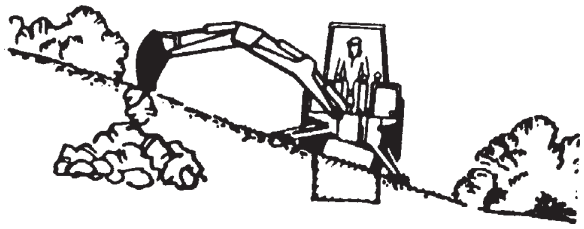


8.4. Side Slope Excavating Or Trenching

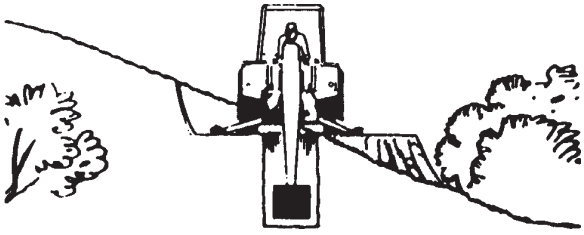
Dig with the backhoe uphill whenever possible.



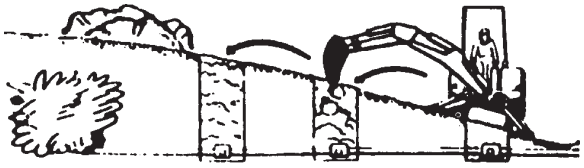
Level the backhoe on slopes with the stabilizers to dig plumb trenches or use the backhoe or loader to cut a level slot for the uphill wheel and stabilizer. Pile the spoil from the slot on the high side.



When on the side of a steep slope, cut a level surface along the uphill side of the trench with the loader.
Pile the spoil of the cut downhill. When digging, pile the spoil of the trench uphill.

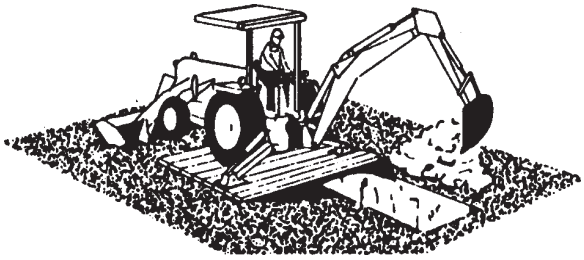


Dig field trenched progressively. As soon as one trench is completed, have the workmen lay the tile. Start the next trench, using the spoil to fill the previous trench.



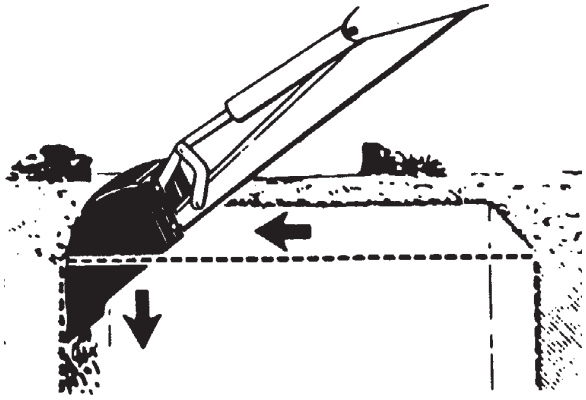
8.5. Miscellaneous

When finishing straight walls or bellholes in sandy soil, use a platform under the rear tires and the stabilizers. The platform distributes the load over a larger area and lessons the possibility of a cave-in. The platform also tends to keep the unit from creeping rearward if hard digging is encountered.

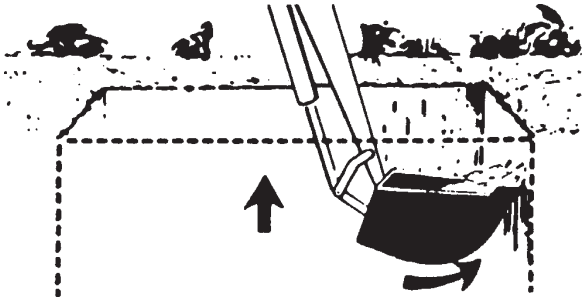


8.6. Finishing Straight Walls

Finish the far wall by crowding out while forcing the bucket down from the boom. Actuate the bucket (curl out) to keep the bottom of the bucket vertical.



To finish the near wall, lift up and crowd in. Keep the edges of the bucket horizontal



8.7. Backfilling

Backfill by lifting the bucket over the spoil pile and then crowding in. Pull both the crowd and boom controls for smooth, even backfilling.

IMPORTANT: Do not backfill by using the swing circuit and dragging the bucket sideways. Doing so can cause damage to the bucket, dipper, boom, and swing cylinders or mainframe.

9. DISMOUNTING BACKHOE FROM TRACTOR

MOUNTING INSTRUCTIONS FOR BACKHOE MODEL 3715:

CAUTION: Before leaving tractor seat, stop engine, lock brakes, relieve hydraulic pressure, and remove key.

CAUTION: Do not allow bystanders in area of backhoe when mounting, dismounting or when operating backhoe.

CAUTION: Do not stand, walk, or work under a raised backhoe component unless it is securely blocked or held in position. Accidental movement of valve handle/handles or leaks in the hydraulic system could cause backhoe component to drop, causing serious injury.

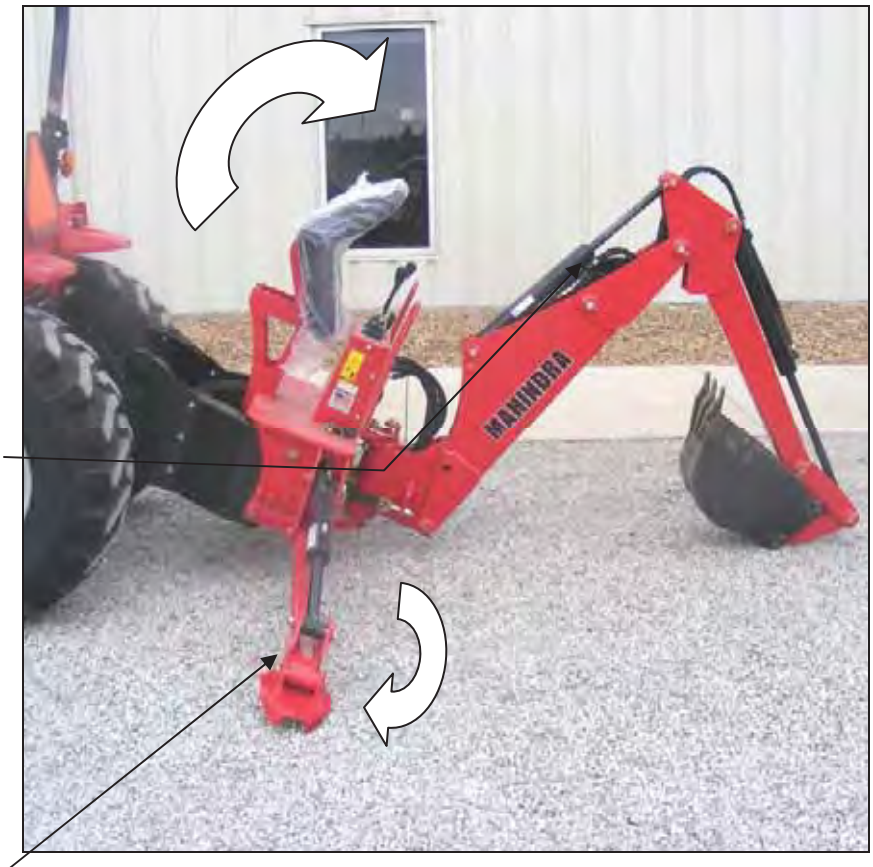
WARNING: Make sure tractor is in neutral with parking brake set if you mount or dismount the tractor with engine running. Failure to follow these instructions could cause damage and or personal injury or death.

CAUTION: Operator must keep hands and body out of the area between the backhoe and tractor when mounting and dismounting the backhoe. Failure to follow these instructions could result in serious injury.

9.1.36. Extend dipper stick slightly, remove boom transport locking pin only do not remove swing locking pin, lower boom until backhoe bucket rest on ground, then put some down pressure on the boom which will then rotate backhoe subframes toward tractor loosening backhoe quick attach pins. When pins are loose remove them.

Locate Dipper Stick so it is about 90° to bottom of Boom, then put a small amount of down pressure on Backhoe so Quick Attach Pins can be removed
Stabilizer can be lowered but should not be resting on ground when dismounting Backhoe
MAHINDRA
90°
Down Force

9.1.37. Retract the boom cylinder so the backhoe rotates rearward. Stabilizer must not contact ground while positioning backhoe.



Retract Boom Cylinder which will rotate Backhoe rearward and out of bottom hooks of Backhoe Subframe

9.1.38. When backhoe mainframe is close to resting on ground, extend both stabilizers equally until subframe pin is lifted from subframe hook.

Subframe Pin

Subframe Hook

9.1.39. Drive tractor forward then raise stabilizer and boom so the backhoe sets on the ground as shown. Shut tractor off and relieve hydraulic pressure in the backhoe making sure the backhoe is stable when parked.

Backhoe Subframe, Mainframe and Bucket resting on ground

9.1.40. Shut tractor off then disconnect backhoe hydraulic quick couplers from tractor. Connect the female quick coupler to the male quick coupler at the tractor. This must be done to keep the tractor from going over the main pressure relief, which would cause hydraulic oil temperature to raise causing damage to tractor and loader not covered under warranty.

This hose must be looped as shown and connected to lower Quick Coupler. Position this hose so it will not be damaged when 3-Point linkages are attached

9.1.41. Store attaching pins in the backhoe subframe extensions.

9.1.42. When backhoe is parked install 3-point linkages and drawbar back on tractor. Reinstall proper counter balance to tractor as identified in your loader operator manual.

CAUTION: If using tractor for loader use, original rear ballast MUST be reinstalled on tractor for safety and stability.

10. MOUNTING BACKHOE TO TRACTOR

CAUTION: Before leaving the tractor seat, stop engine, lock brakes, relieve hydraulic pressure, and remove key.

CAUTION: Do not stand, walk, or work under a raised backhoe unless it is securely blocked or held in position. Accidental movement of valve handle/handles or leaks in the hydraulic system could cause the backhoe to drop, causing serious injury.

CAUTION: Do not allow bystanders in loader work area.

WARNING: Make sure tractor is in neutral with parking brake set if you mount or dismount the tractor with engine running. Failure to follow these instructions could cause damage and or personal injury or death.

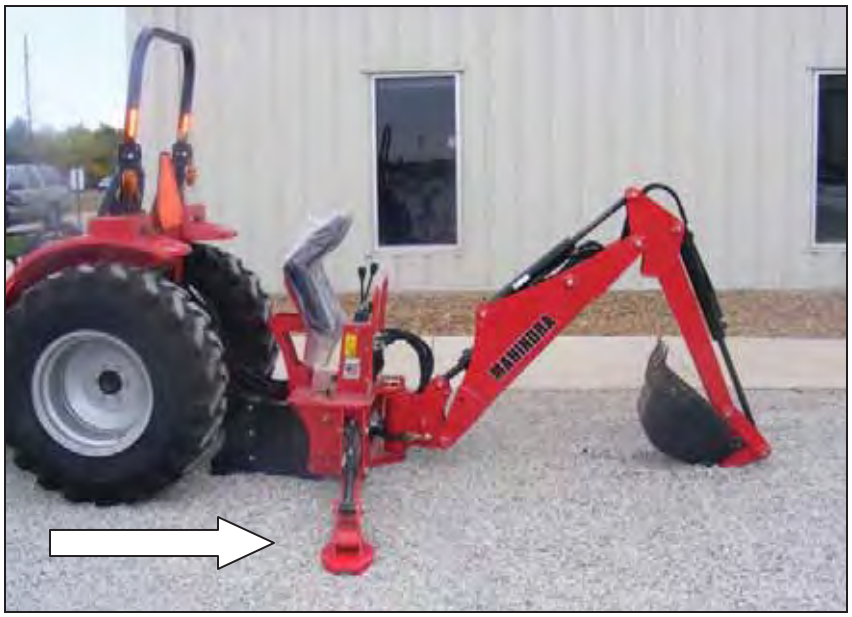
IMPORTANT: When backhoe is installed on tractor all 3-point linkages and drawbar must be removed from the tractor and stored separate from unit. ***Never store these components on tractor, backhoe or loader.***

To aid in mounting and dismounting loader, apply a small amount of grease, if needed, to top bushing of backhoe subframe along with lower hook.

Apply small amount of grease inside this bushing

Apply small amount of grease to this hook area

10.1.36. Back tractor up centering lower hooks on tractor subframes with lower pin on the backhoe subframes. Shut engine off and then connect backhoe hydraulic quick couplers to tractor quick couplers.



10.1.37. Raise the boom which will rotate the backhoe rearward. When backhoe lower pins are high enough to clear the hooks on the backhoe subframes, back tractor up until hooks and pins are aligned.

You may need to reposition Dipperstick to allow the Backhoe to tilt rearward enough for pins to clear hook

Helpful Hint: When mounting backhoe to tractor keep rear of backhoe close to ground so bottom hooks can be engaged.

10.1.38. When hooks and pins are aligned, extend boom cylinder so backhoe rotates forward until top subframe holes are aligned and quick attach pins can be installed.

Rotate until these holes align and Quick Attach Pin can be installed

10.1.39. Install quick attach pins and secure using snap pins, one on each end of pin.

Install Quick Attach Pin and secure using Snap Pins, 2 places
Route Hoses so they will not be damage while operating Backhoe

10.1.40. If unit will be operated on roads, always secure a slow moving vehicle (SMV) sign to backhoe bucket cylinder or dipper assembly using appropriate means. Remove sign when digging.

10.1.41. Route 3 backhoe hydraulic hoses so they will not be damaged during backhoe operation.

11. INITIAL BACKHOE OPERATION

11.1. Check the tractor hydraulic oil level and fill if required

11.2. Set tractor engine at a low idle during initial backhoe operation.

11.3. Operate stabilizer cylinders a number of times, fully up and fully down.

11.4. Operate all the functions of the backhoe slowly until all air has been purged from the system.

11.5. Recheck the tractor hydraulic oil level and fill as required.

12. SERVICE

12.1. Service Safety

CAUTION: To avoid possible injury, observe the following safety rules WHEN SERVICING the backhoe.

12.1.1. Engage transport locking pins before servicing the backhoe. Refer to Page 46.

12.1.2. Do not oil, grease, or adjust the backhoe while it is in motion.

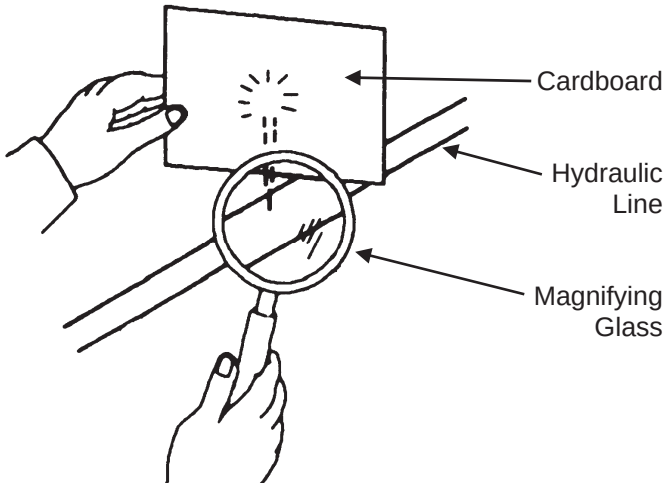
12.1.3. Do not change any backhoe relief valve settings. They are factory set for best performance and safety.

12.1.4. Protect your eyes - wear safety glasses. Guard against injury when driving connecting pins or performing any repair in which particles can chip from work piece or striking tool.

12.2. Hydraulic Fluid

12.2.1. With the engine off and the backhoe on the ground, inspect all hoses for cuts or wear. Check for signs of leaks and make sure all fittings are tight.

CAUTION: Escaping hydraulic fluid under pressure can have sufficient force to penetrate skin, causing serious personal injury. Before disconnecting lines, be sure to relieve all pressure.
Before applying pressure to system, be sure all connections are tight and that lines, tubes, and hoses are not damaged.
Fluid escaping from a very small hole can be almost invisible. Use a piece of cardboard or wood, rather than hands, to search for suspected leaks.
If injured by escaping fluid, see a doctor at once. Serious infection or reaction can develop if proper medical treatment is not administered immediately.



12.3. Beginning Of Season

12.3.1. Remove all protective covering.

12.3.2. Check hydraulic hoses for deterioration and replace, if necessary.

12.3.3. Lubricate all grease fittings and oil handle linkages.

12.3.4. Check hydraulic system for loss of fluid and, if necessary, fill to proper level.

12.3.5. Tighten all loose bolts, nuts and set screws.

12.3.6. Inspect bucket teeth and, if necessary, replace them.

12.3.7. Operate the backhoe slowly for a short time before placing the unit under full load.

12.4. Bleeding Backhoe Hydraulic System

12.4.1. If the hydraulic hoses have been disconnected from the backhoe or tractor, all trapped air must be removed after the hoses are connected. Start tractor engine and operate backhoe through all movements fully, several times, to purge the system of air.

12.5. Hydraulic System Hoses

12.5.1. Oil leaks in the pressure side of the system can be located by carefully inspecting the external area of the hoses and fittings.

12.5.2. When tightening connections, always use two wrenches.

IMPORTANT: Do not over-tighten fittings. Make them tight enough to eliminate leaks.

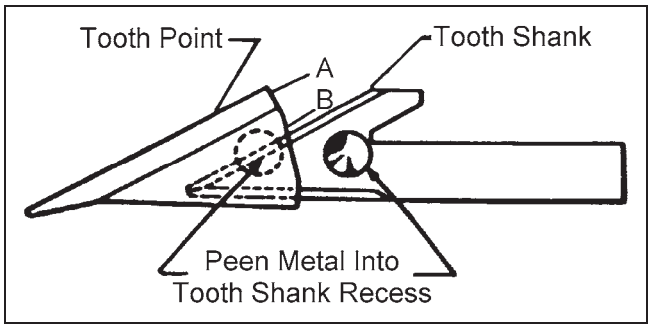
12.5.3. Hoses on any backhoe are very severely worked and will fail in time. Examine them regularly and replace any that show signs of failure. Pay careful attention to the routing of hoses so they can move fully and freely without kinking, and cannot be pinched or cut by any part of the backhoe.

12.6. Weld On Tooth Replacement

12.6.1. The bucket tooth points are self-sharpening and will require little attention; however, these points on the bucket shanks can be replaced when they become badly worn or broken.

12.6.2. A tooth point can be removed from the welded tooth shank by hammering at “A” on the tooth point or by driving a chisel at “B”, just between the tooth point box section and the tooth shank. Install the new point and anchor it to the shank by peening at the location shown.

12.6.3. If a tooth shank breaks off, becomes damaged, or lost so that it cannot hold a tooth point, a new shank should be welded to the bucket in its place.

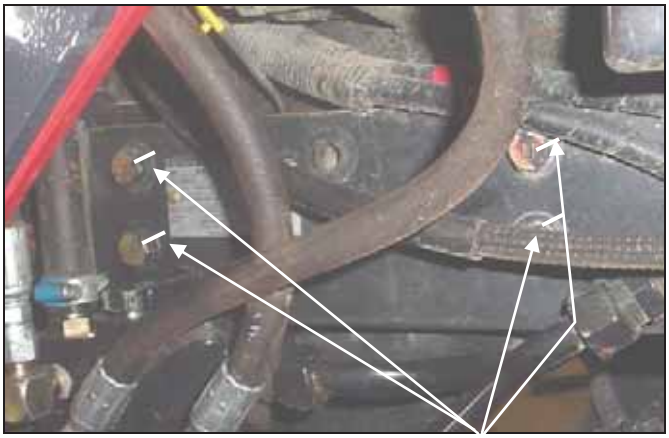


12.7. Tightening Nuts and Bolts

12.7.1. Check all hardware on backhoe and tractor daily before operation. Tighten hardware as specified. See Torque Chart, Page 82 for backhoe bolt torques. See tractor operators manual for tractor bolt torques.

12.8. Check Tractor Side Rails Hardware:

Check tractor side rail hardware to make sure no bolts have loosened. If bolts have loosened retorque per tractor operators manual.



Tractor Engine Rail Bolts.

12.9. Check Backhoe Rear Bracket Hardware

12.9.1. These bolts should have been removed cleaned, "Loctited", torqued and marked during backhoe installation. If this was done, operator can simply check that all bolts have remained on their marks. If any of these bolts have moved off their marks, they must be removed cleaned, "Loctited", torqued and remarked before operating unit.

IMPORTANT: These bolts must remain tight during operation to prevent damage to your tractor.

Generic Photo

Backhoe Rear Bracket Bolts with Alignment Marks, 8 places total.

12.10. Check Pivot Pins

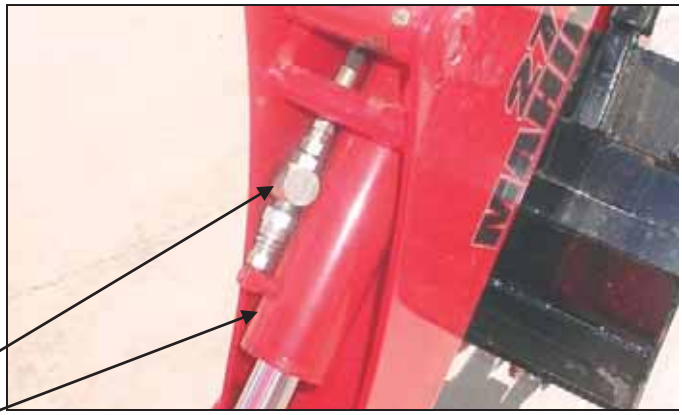
12.10.1. Check all pivot pins for bolts, washers, and nuts, if missing or damaged, replace.

12.11. In-Line Orifice

12.11.1. Your backhoe is equipped with an in-line orifice in the boom cylinder rod end. This orifice allows smooth operation of backhoe when lowering backhoe into a hole.

12.11.2. If servicing boom cylinder, always make sure orifice is installed so the oil coming out of this cylinder is metered.

NOTE: Position flat side of orifice plate toward hose.



12.12. Lubrication

12.12.1. Economical and efficient operation of the backhoe is dependent upon regular and proper lubrication of all moving parts with a quality lubricant. Using high quality grease when servicing unit will result in less wear.

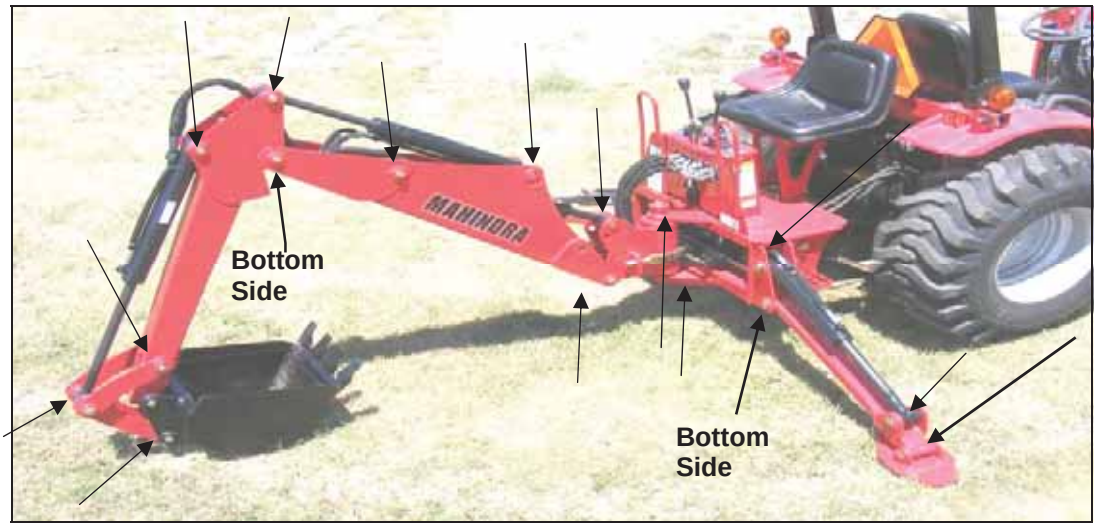
IMPORTANT: Avoid excessive greasing. Dirt collects on exposed grease and increases wear greatly. Clean all fittings thoroughly before using grease gun. After greasing, wipe off excessive grease from fittings.

12.12.2. Lower stabilizers to the ground, extend dipper and bucket cylinders, and lower boom assembly so bucket rests on the ground as shown.

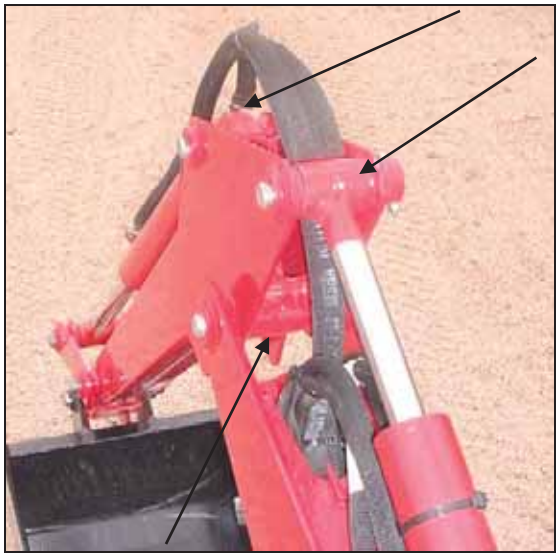
12.12.3. Refer to photos on the next page for the location of all grease fittings.

12.12.4. Lubricate parts provided with grease fittings and all pivots during initial setup and then at least twice daily, once at the beginning of operation and again approximately halfway through the work day or after every 5 hours of operation or as indicated.

12.12.5. If any grease fittings are missing, replace them immediately.

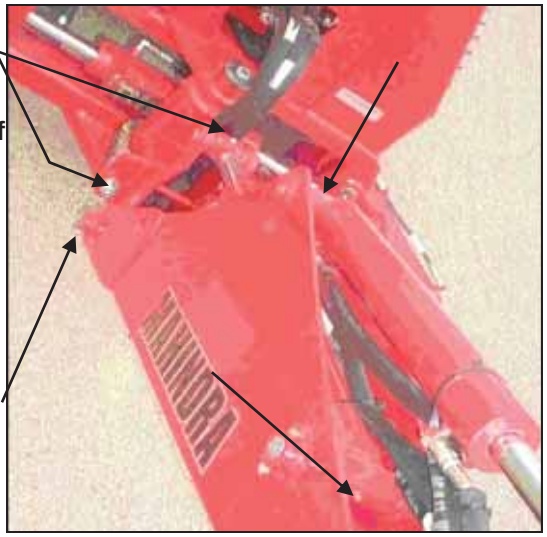


General Grease Zerk Locations

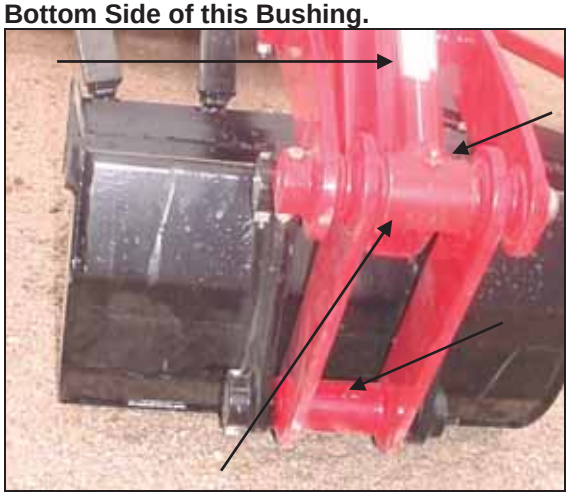


Dipper Pivot Grease Zerk is located on Bottom Side of this Bushing.

Swing Grease Zerks are Located on Opposite Side of Swing Assembly. One on Top and One on Bottom of Swing Assembly.



Boom Pivot Grease Zerk is located on Bottom Side of This Bushing.



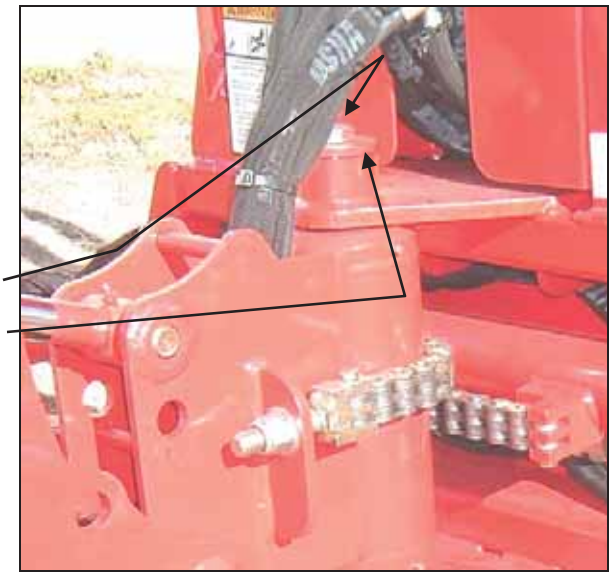
Front Side of Dipper Assembly. Lubricate Bucket Pivots and Linkages every 5 Hours of Operation.

Stabilizer Pivot Grease Zerks, 4 places each side. See General Lubrication Photo for Stabilizer Opposite End Grease Zerk Locations.

12.13. Swing Pivot Service

12.13.1. The Swing Assembly King Pin Retaining Bolt was cleaned, Shimmed, "Loctited" and torqued to 150 ft. lb. at the Factory.

12.13.2. If servicing swing bearings, always clean, "Loctite", and reassemble using King Pin Retaining Bolt, .075” Shim and Special Washer as shown, torque to 150 ft. lb.

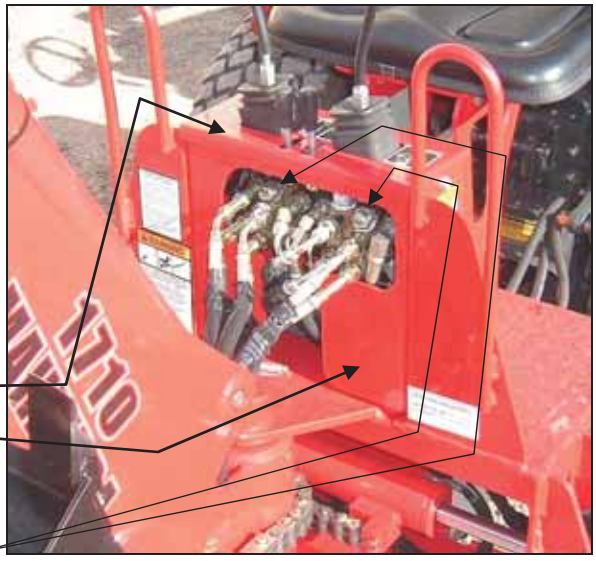


12.14. Valve And Handle Linkage Service

12.14.1. Inspect console valve, handle linkage, and hoses after every 6 months of operation.

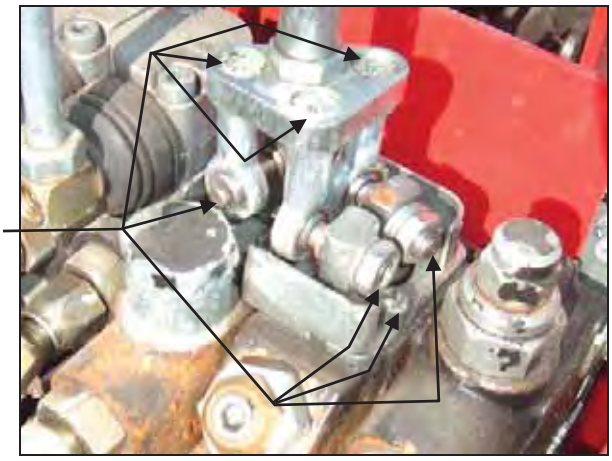
12.14.2. Remove 4 bolts from each side of console control panel and remove 2 bolts from each side of valve cover plate assembly, then remove console cover and valve cover plate assembly. Backhoe valve, handle components, and hoses will be exposed.

12.14.3. Clean and inspect all components for damage, replace as required. Lubricate all handle components with a high grade of spray lubricant.



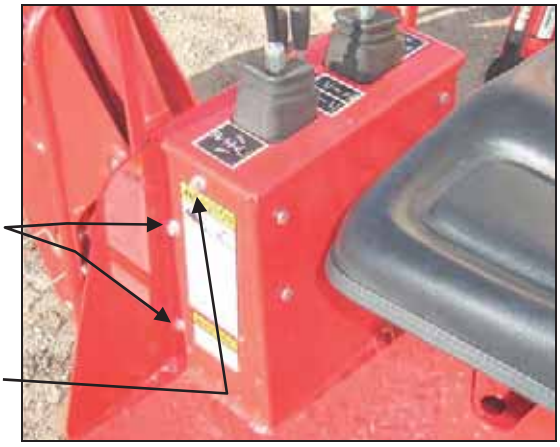
WARNING: Never adjust any pressure reliefs in Backhoe Valve. Failure to follow these instructions could cause damage to Backhoe and or personal injury or death.

12.14.4. If valve handle is loose check to make sure mounting hardware is secure. Replace any worn or damaged control handle parts.



NOTE: Damaged control handle components caused by hardware loosening during operation is not covered under warranty. If handles seem loose during operation, stop operation and service these components.

12.14.5. Replace front cover and secure using Hex Bolt 1/4"-20NC x 1" Grade 5, Lockwasher, and Flatwasher, 2 places each side. Replace valve cover plate assembly and secure using Hex Bolt 1/4"-20NC x 1" Grade 5, Lockwasher, and Flatwasher, 1 place each side.



Hex Bolt 1/4"-20NC x 1" Grade 5, Lockwasher, and Flatwasher, 2 places each side

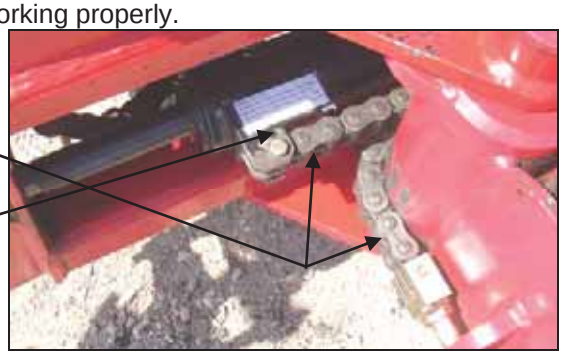
Hex Bolt 1/4"-20NC x 1" Grade 5, Lockwasher, and Flatwasher, 1 place each side

12.14.6. **SWING CYLINDER INITIAL OPERATION:** Operate swing cylinder fully right and left at a slow speed. This will insure that cylinder is full of oil and orifices are working properly.

12.15. Swing Chain Service

12.15.1. Lubricate the chain when it appears to be dry. Use a high grade of chain lubricant when servicing.

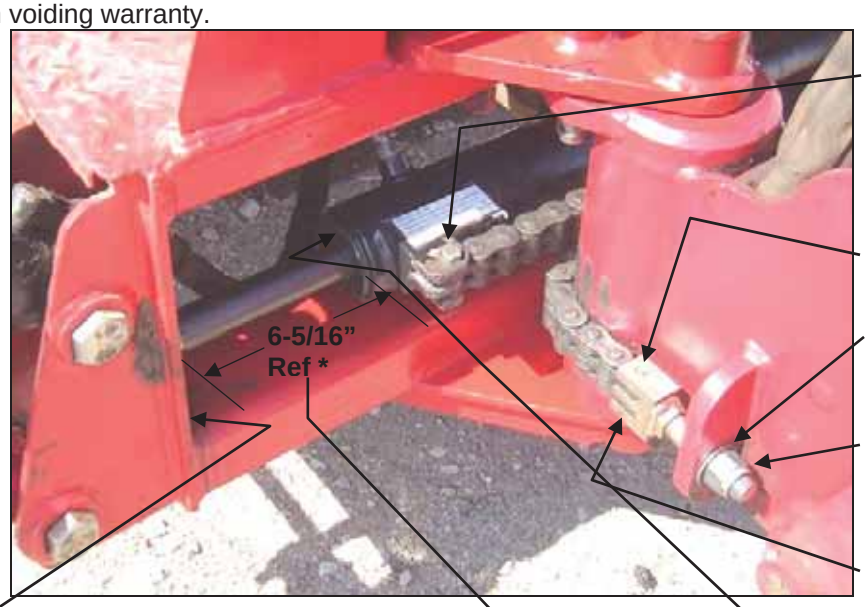
SERVICE NOTE:
At every 50 hours of backhoe operation, replace the hardware that secures the swing chains to the swing cylinder. Use 3/8" 16NC x 1 3/4" Grd. 8 bolts, torque to max. of 54 ft. lbs.
0595-3176



12.16. Swing Chain Adjustment and Service Instructions

12.16.1. When you first receive backhoe, and periodically thereafter, it will be necessary to adjust the swing chains. Keeping swing chains in proper adjustment will allow backhoe to swing the same distance from right and left and will keep from voiding warranty.

12.16.2. Secure swing cylinder by installing swing transport locking pin. Adjust swing chain by loosening or tightened 3/4" locknut until measurements from the cylinder tube end and the backhoe end plate are the same from right hand and left hand sides. This will allow backhoe to swing the same distance right and left.



Position Bolt Head Upward in Upper Chain, 2 places. Torque to 54 ft. lbs. max.

Chain Bolt.

Flatwasher 3/4" Hardened.

Hex Nut 3/4"-10NC Nylon Lock.

Position Bolt Head Downward in Lower Chain, 2 places.

Backhoe End Plate.

Measurements for RH and LH sides must be the same.

Cylinder Tube End.

IMPORTANT: If chain becomes loose during operation, immediately adjust as described and tighten nylon locknut to equalize swing travel.

*** This reference dimension is for a Monarch Swing Cylinder and should be checked both on RH and LH sides before backhoe operation.**

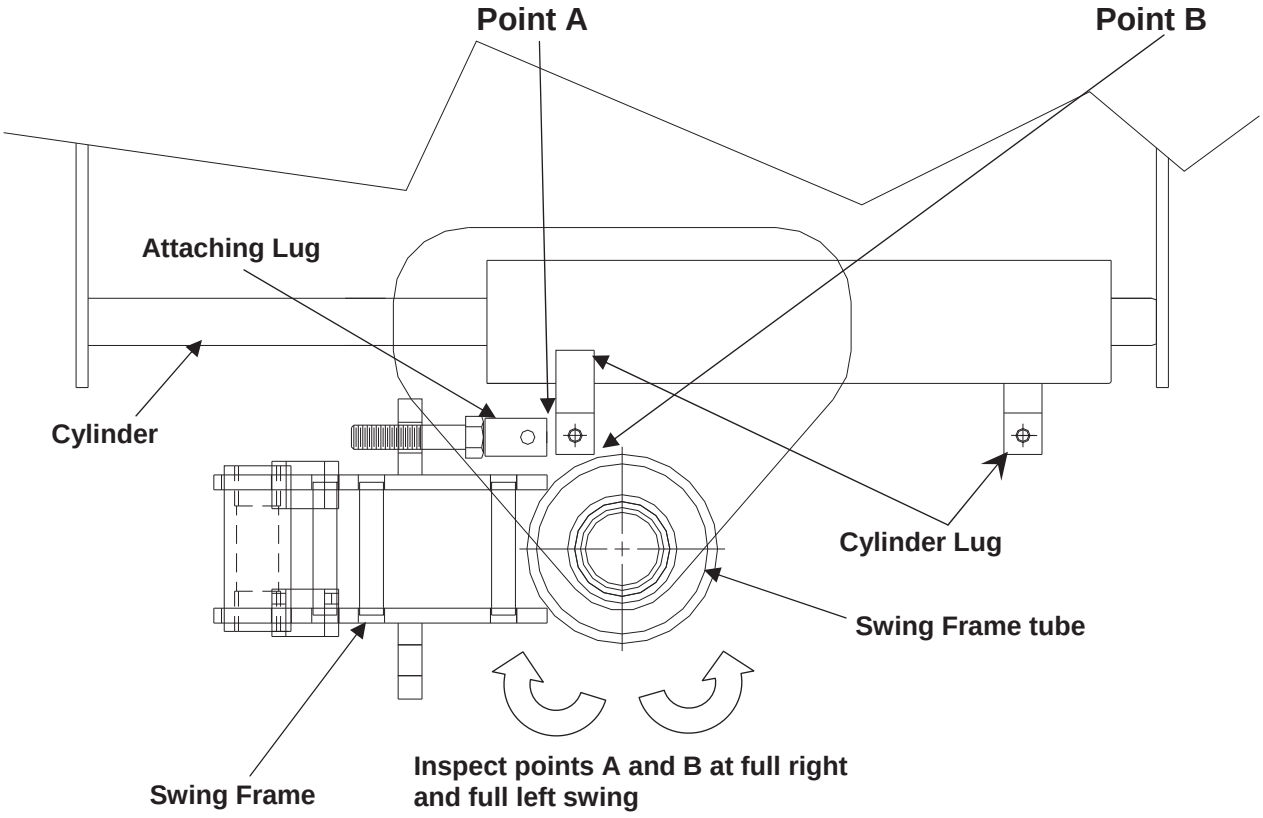
Swing Chain Adjustment and Service Instructions

IMPORTANT

NOTE A: Swing chain adjustment and service is critical to trouble free operation of your backhoe. Adjust swing chains as specified in 12.16.2. instructions in this manual then cycle backhoe swing fully right, inspect Point A and Point B components to make sure no contact exists, then repeat with backhoe swung fully left. If contact either direction is found readjust swing chains and reinspect specified areas.

Point A: If swing chains are adjusted properly there will be no contact between chain adjustment lug and cylinder lug. If contact exists adjust swing chains.

Point B: If swing chains are adjusted properly there will be no contact between cylinder lug and swing frame tube. If contact exists adjust swing chain.



Swing Chain Adjustment and Service Instructions

IMPORTANT

NOTE B: After every 50 hours of backhoe operation, replace the hardware that secures the swing chains to the cylinder. Use only factory approved 3/8”-16NC x 1-3/4” Grade 8 bolts, torque these bolts to a max. of 54 ft. lbs. of torque.

Replace 3/8”-16NC x 1-3/4” grade 8 bolts every 50 hours of backhoe operation, 2 places.

SERVICE NOTE:
At every 50 hours of backhoe operation, replace the hardware that secures the swing chains to the swing cylinder. Use 3/8" 16NC x 1 3/4" Grd. 8 bolts, torque to max. of 54 ft. lbs.
0595-3176

IMPORTANT: Failure to follow NOTE: A and B instructions could result in cylinder damage caused by chain attaching bolts shearing because of normal wear of this bolt or backhoe components contacting each other during operation, failures in this area caused by incorrect swing chain adjustment or servicing of attaching bolts are not covered under warranty.

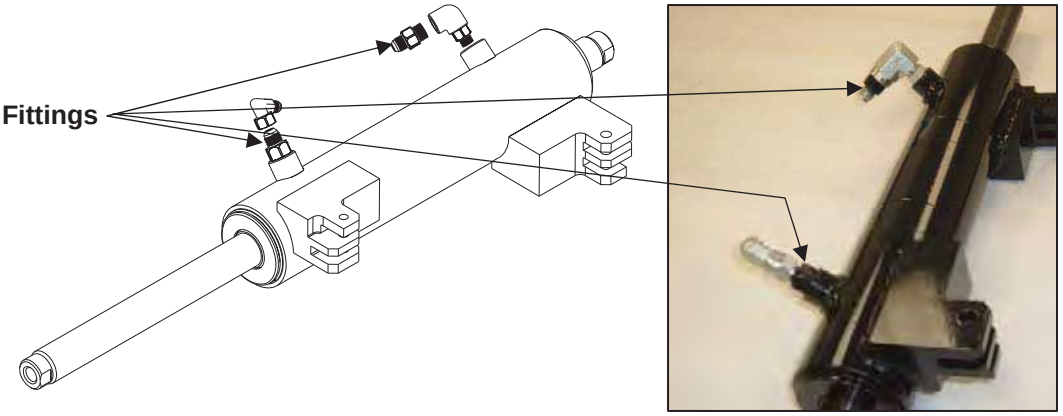
12.17. Swing Chain Replacement

12.17.1. Secure swing cylinder by installing swing transport locking pin. Remove nuts, flatwashers, chain bolts, hex bolts, and chains from backhoe. Lay new swing chains into position and secure to swing cylinder and chain bolts using new Hex Head Cap Screw 3/8”-16NC x 1-3/4" Grade 8, 2 places in each chain. Secure chain bolt using new Flatwasher 3/4" Hardened and Hex Nut 3/4"-10NC Nylon Lock, 1 place each side.

NOTE: Bolt heads must be positioned downward in lower chain and upward in upper chain as shown above to prevent damage to bolts or other backhoe components. If you are replacing your swing cylinder always replace swing chains and hardware.

12.17.2. Never remove orifice fittings from swing cylinder and operate backhoe. Failure to follow these instructions will cause damage to swing cylinder not covered under warranty.

Orifice Fittings



12.18. Servicing Monarch Manufactured Swing Cylinder

NOTE: Replace Seals as follows:

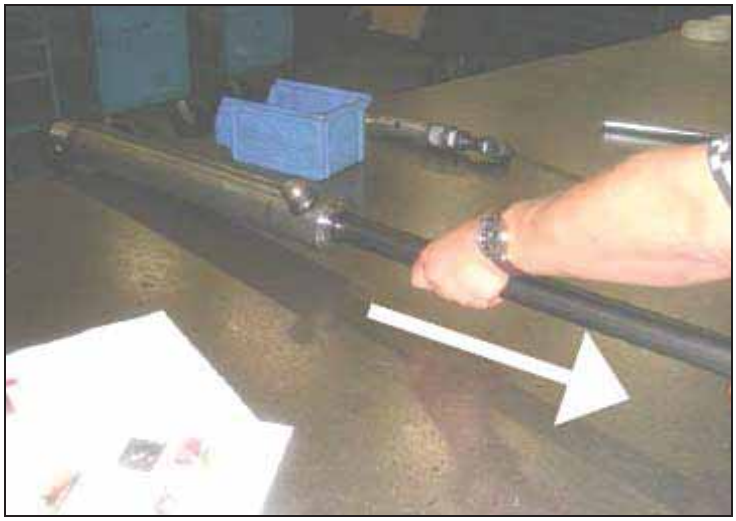
12.18.1. Relieve all oil pressure in system. Refer to your Backhoe operator's manual and review all safety items. Clean swing cylinder and port connections. Disconnect hydraulic hoses from your swing cylinder.

12.18.2. Remove Swing Cylinder from your Backhoe by loosening swing chain adjustment bolts and then removing the two mounting bolts. Remove fittings from your swing cylinder making sure you remove the check valves that are located in each port.

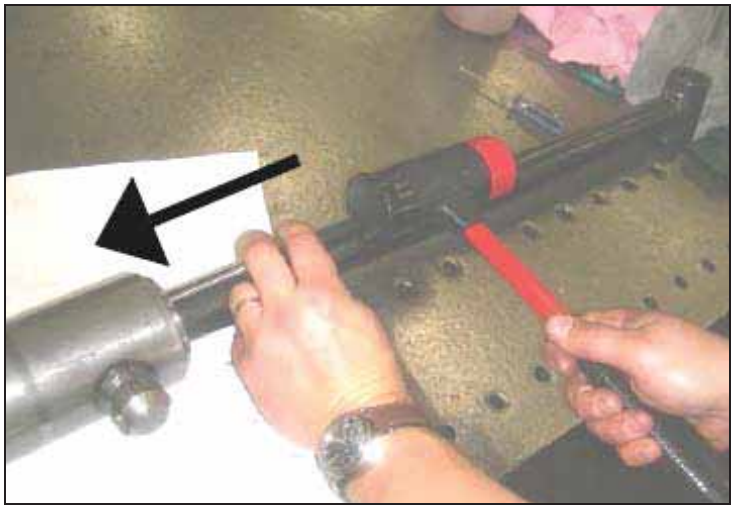
12.18.3. Tools required are: Rubber mallet, screw driver, punch, supplied plastic rings, supplied band clamp and pliers.

12.18.4. Remove external steel wire ring.

12.18.5. Fully extend rod one direction.

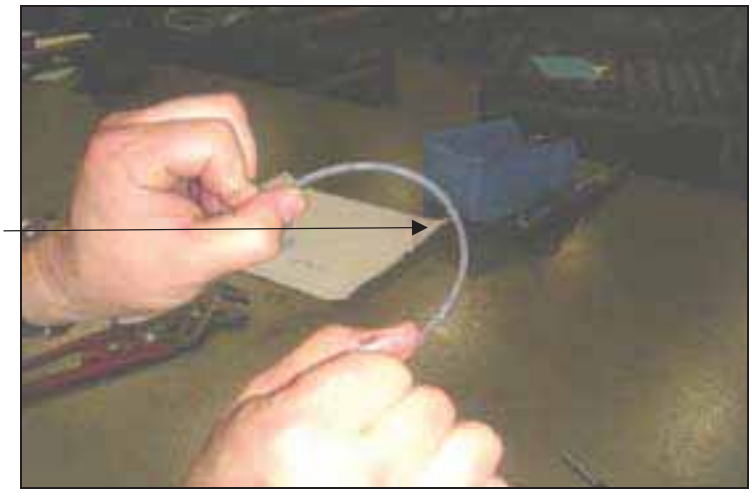


12.18.6. Using a punch carefully force head into cylinder until internal tube groove is fully exposed.

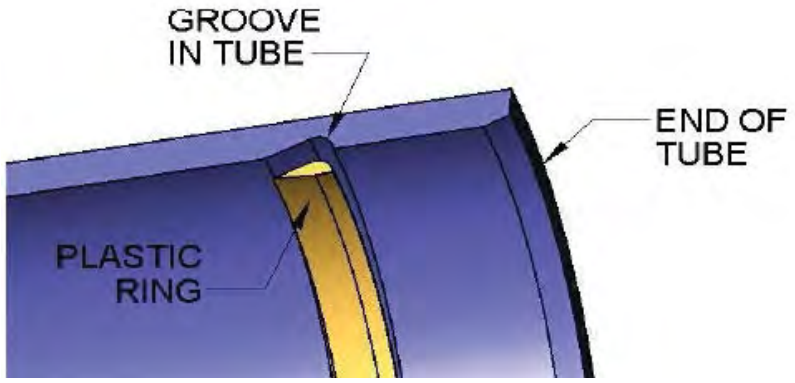


12.18.7. Included with your seal kit is a plastic ring. Take curl out of ring before installing it into the cylinder tube groove. Refer to steps 12.18.8 and 12.18.9 for details.

Take curl out of Plastic Ring for ease of installation



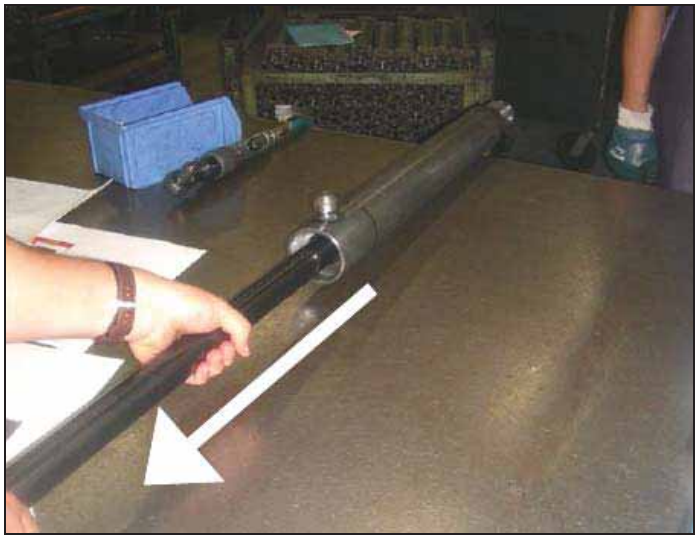
12.18.8. NOTE: Plastic ring profile must match tube groove profile.



12.18.9. Use a screwdriver to hold one end of the ring in the groove while fitting the other end of the ring into the groove. Tips should snap in together.

NOTE: Do not cut the ring shorter as it will not stay in the groove properly. It is important to ensure the ring is completely in the groove before pulling the rod out. If the ring sticks out it will get stuck between the head and the tube.

12.18.10. Pull head out of tube using cylinder rod.



NOTE: If the head does not pull out easily, push the head back in and check that the plastic ring is properly in the groove. Replace ring if necessary. (A second ring has been provided in case the first ring gets damaged.) CAUTION: Excessive force will not overcome a jammed ring and could damage the cylinder.

12.18.11. Completely remove rod and head from tube.

12.18.12. Remove plastic ring installed in step 12.18.9.

12.18.13. Replace ALL seals on cylinder. Leave head O-ring loose as shown.

12.18.14. Use band clamp supplied with seal kit to compress internal retaining wire ring so it will go into the tube. Make sure band clamp cam is not over top of gap in wire ring.

Band Clamp

Make sure Cam is not over top of gap in ring

12.18.15. Lubricate seals and tube using high grade hydraulic fluid.

12.18.16. Insert head into tube.

12.18.17. Tap head into tube until band clamp slides off of internal retaining ring and ring is inside of the tube.

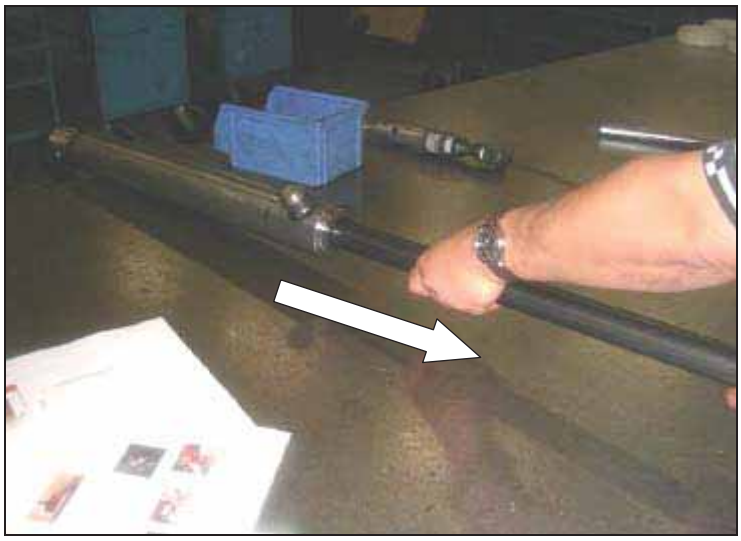
12.18.18. Loosen band clamp and remove.

12.18.19. Install O-ring (from step 12.21.13).

12.18.20. Tap the head the rest of the way in (flush with tube).

NOTE: The head must be flush with the tube to allow the ring to snap into the groove. Failure to insert the head as shown will result in the head and rod assembly coming out of the tube when pressure is applied to the cylinder.

12.18.21. Pull rod out to expose external wire ring groove in cylinder head.



12.18.22. Insert external wire ring into cylinder head groove.

12.18.23. Change cylinder head seals on opposite head by following steps 12.18.4 through 12.18.10. Do not pull rod and piston from cylinder tube.

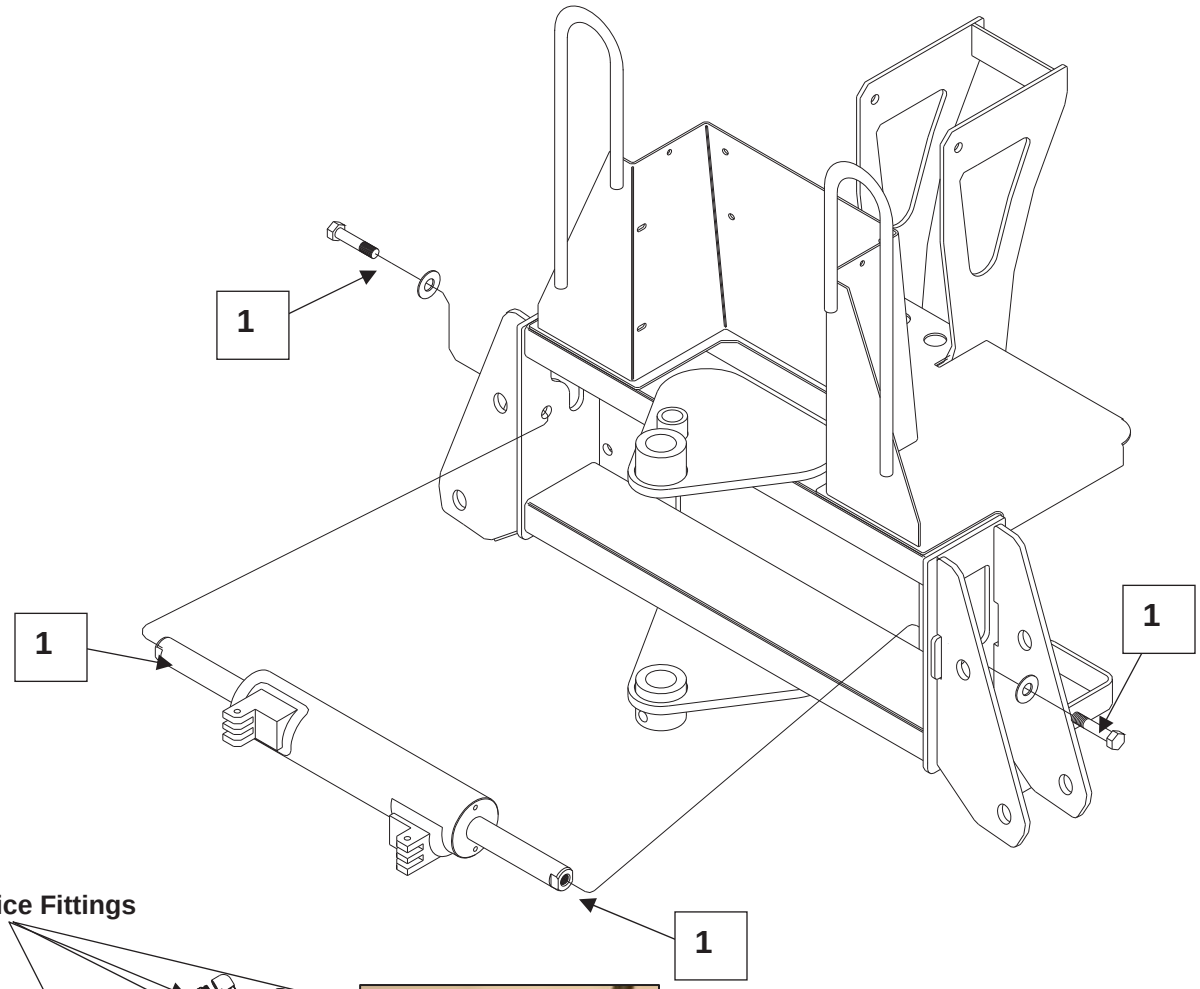
12.18.24. Replace seals on head following instructions in step 12.18.13.

12.18.25. Reassemble cylinder by following steps 12.18.14 through 12.18.22.

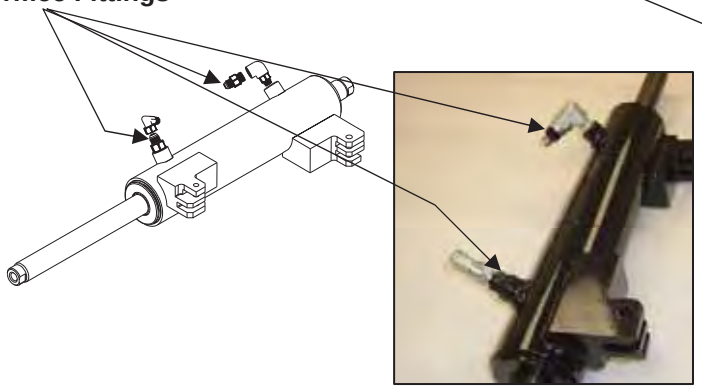
12.18.26. This next step is very important to insure that this hardware will remain tight during backhoe usage. Using 242/243 Loctite, put a drop inside the cylinder rod end threads and a drop on the bolt threads. Using flatwasher install these mounting bolts. Immediately after these bolts are installed, torque these bolts to 180 ft lbs. Rotate port fittings as required to clear all components and then install hoses. Start unit and fill swing cylinder with oil slowly to check for leaks.

1. Apply Loctite to these areas.

NOTE: This process will take one hour or less if you have the proper tools.



Orifice Fittings



NOTE: Before operating backhoe swing cylinder make sure orifice fittings have been installed in cylinder ports. Failure to install orifice fittings will cause damage to swing cylinder not covered under warranty.

13. Troubleshooting Procedures

Problem	Cause	Correction
Machine fails to operate when started initially.	Low oil supply in reservoir	Fill to proper level.
	No oil supply to machine	Oil is not being diverted from the prime mover hydraulic system. Be sure that the proper controls are actuated on the prime mover.
	Pump not running – if backhoe is equipped with PTO Pump	Check pump drive to be sure it is engaged.
	Improper hose connection	**Important: Be sure pressure, power beyond, and tank out hoses are hooked up correctly. Improper hook-up will result in damage to the backhoe valve.**
	Excessive back pressure	Relieve condition. Restriction may be from valve outlet to reservoir.
	Relief valve setting in backhoe control valve too low or defective	Relief pressure will have to be checked and corrections made. Relief valve may need cleaning and/or overhauling or entire cartridge must be replaced.
Machine loses power after operating satisfactorily initially.	Loose oil line connections, leaks in line or broken lines	Tighten all hose connections and replace any damaged O-rings at leaking O-ring fittings. Check and replace any damaged hoses and lines.
	Oil is bypassing cylinder piston, scored piston, worn piston packing, or defective piston assembly	Replace or rebuild cylinder; replace damaged parts.
	Diverter valve on prime mover leaking or bypassing oil internally through valve to reservoir	Diverter valve may need rebuilding or replacing
	Excessive back pressure	Relieve condition. Restriction may be from valve outlet to reservoir.
	Relief valve setting in backhoe control valve too low or defective	Relief pressure will have to be checked and corrections made. Relief valve may need cleaning and overhauling, or entire cartridge must be replaced
Loss of power in lift or crowd cylinder, but other cylinders function properly.	Spool not moved to full stroke	Check spool travel.
	Working port relief valve in the control valve stuck open or malfunctioning	Clean relief carefully but do not disturb its pressure setting as it cannot be field calibrated, or replace cartridge.
	Problems involving the control valve	This valve is a precision device and is not intended for any extensive field adjustment or repair. Field replacement parts are limited to seal kits, cartridges, valve sections and tie rods. Replacement of these parts, the opening of check cavities and certain relief cavities to examine for trapped dirt, or resetting of the main relief valve with the use of good pressure gauge, should be referred to qualified service personnel. Dirt and shreds of packing material are the usual causes of valve malfunction. Be sure the reservoir oil supply is kept clean and only factory supplied packing are used in cylinder repair. Everything must be clean and free of dirt during oil line removal and replacement, and during any cylinder work.
Loss of power in any one cylinder, including boom and crowd.	Loose oil line connections, leaks in line or broken lines	Tighten all hose connections and replace any damaged O-rings at leaking O-ring fittings. Check and replace any damaged hoses and lines.

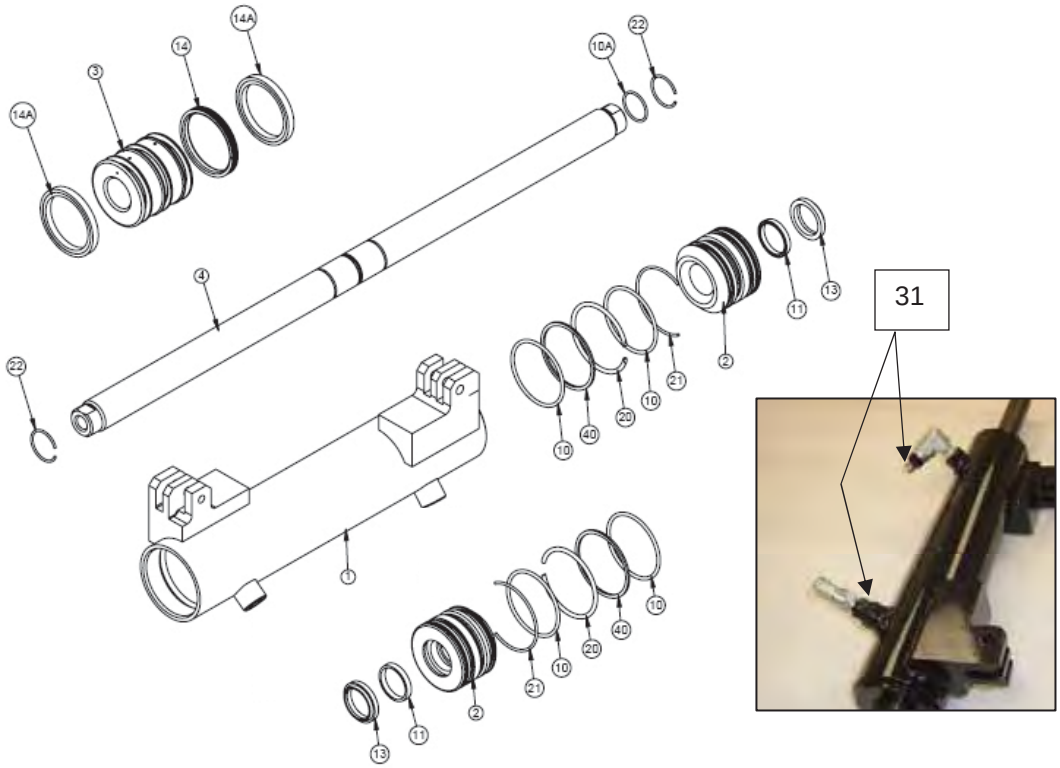
Problem	Cause	Correction
Loss of power in any one cylinder, including boom and crowd.	Restrictions in oil lines	Check and replace any damaged hoses and lines. Check for pinched hoses.
	Oil is bypassing cylinder piston, scored piston, worn piston packing, or defective piston assembly	Replace or rebuild he cylinder; replace damaged parts.
	Scored piston rods and worn guides in cylinder	Replace or rebuild cylinder; replace damaged parts.
	Bent piston rod in cylinder	Replace or rebuild cylinder, replace damaged parts.
	Worn or damaged rod seals on cylinders; external leaks	Repack cylinder. Rebuild cylinder, replacing damaged parts as necessary.
	Spool not moved to full stroke	Check spool travel.
	Working port relief valve in the control valve stuck open or malfunctioning	Clean relief carefully but do not disturb its pressure setting as it cannot be field calibrated, or replace cartridge.
	Worn control valve	Replace the control valve.
Loss of power in swing cylinders, but other cylinders functioning properly.	Loose oil line connections, leaks in line or broken lines	Tighten all hose connections and replace any damaged O-rings at leaking O-ring fittings. Check and replace any damaged hoses and lines
	Restrictions in oil lines	Check and replace any damaged hoses and lines. Check for pinched hoses
	Oil is bypassing cylinder piston, scored piston, worn piston packing, or defective piston assembly	Replace or rebuild cylinder; replace damaged parts
	Scored piston rods and worn guides in cylinder	Replace or rebuild cylinder; replace damaged parts
	Bent piston rod in cylinder	Replace or rebuild cylinder; replace damaged parts.
	Worn or damaged rod seals on cylinder; external leaks	Repack cylinder. Rebuild cylinder, replacing damaged parts as necessary
	Spool not moved to full stroke	Check spool travel.
	Contamination in cylinder blocking orifice fitting.	Disassemble orifice fitting and clean orifice holes.
	Worn control valve	Replace the control valve
Maximum swing action cannot be obtained.	Bent piston rod in cylinder	Replace or rebuild cylinder; replace damaged parts
	Something jamming the swing linkage	Remove interference
	Swing chain not adjusted properly.	Adjust swing chain per operator's manual.
Slow operation of machine (lack of power) all cylinders.	Low oil supply in reservoir	Fill to proper level
	Oil viscosity too heavy, or oil is not at operating temperature	Use recommended hydraulic fluid. Run machine until oil reaches operating temperature
	Insufficient pumping	Advance engine throttle
	Excessive back pressure	Relieve condition. Restriction may be from outlet to reservoir
	Relief valve setting in backhoe control valve too low or defective	Relief pressure will have to be checked and corrections made. Relief valve may need cleaning and overhauling, or entire cartridge must be replaced
Spongy or jerking action of cylinders and/or noisy operation.	Low oil supply in reservoir	Fill to proper level
	Air in system	Bleed all circuits of air by operating machine at maximum oil flow and through full movements
	Oil viscosity too heavy, or oil is not at operating temperature	Use recommended hydraulic fluid. Run machine until oil reaches operating temperature
	Pump not running – if backhoe is equipped with PTO pump	Check pump drive to be sure it is engaged

Problem	Cause	Correction
Boom, crowd or bucket cylinders drop under load when control spools shifted from neutral.	Damaged or worn spool seals	Replace spool end seals
	Problems involving the control valve	This valve is a precision device and is not intended for any extensive field adjustment or repair. Field replacement parts are limited to seal kits, cartridges, valve sections and tie rods. Replacement of these parts, the opening of check cavities and certain relief cavities to examine for trapped dirt, or resetting of the main relief valve with the use of good pressure gauge, should be referred to qualified service personnel. Dirt and shreds of packing material are the usual causes of valve malfunction. Be sure reservoir oil supply is kept clean and only factory supplied packing are used in cylinder repair. Everything must be clean and free of dirt during oil line removal and replacement, and during any cylinder work.
Load drops or settles.	Loose oil line connections, leaks in line or broken lines	Tighten all hose connections and replace any damaged O-rings at leaking O-ring fittings. Check and replace any damaged hoses and lines.
	Oil bypassing cylinder piston, scored piston, worn piston packing, or defective piston assembly	Replace or rebuild cylinder; replace damaged parts.
	Worn or damaged rod seals on cylinder; external leaks	Repack cylinder. Rebuild cylinder, replacing damaged parts as necessary
	Worn control valve	Replace the control valve
	Damaged or worn spool seals	Replace spool end seals
Leaky cylinders.	Oil bypassing cylinder piston, scored piston, worn piston packing, or defective piston assembly	Replace or rebuild cylinder; replace damaged parts.
	Scored piston rods and worn guides in cylinder	Replace or rebuild cylinder; replace damaged parts
	Bent piston rod in cylinder	Replace or rebuild cylinder; replace damaged parts.
	Worn or damaged rod seals on cylinder; external leaks	Repack cylinder. Rebuild cylinder, replacing damaged parts as necessary
Leaky valve.	Loose oil line connections, leaks in line or broken lines	Tighten all hose connections and replace any damaged O-rings at leaking O-ring fittings. Check and replace any damaged hoses and lines
	Excessive back pressure	Relief condition. Restriction may be from outlet to reservoir
	Paint on valve spool; sticking valve spool or scored valve spool	Clean valve spool. Binding is usually caused from an over tightened plug, mounting bolt, fitting in valve body or tie rod bolt. If a plug or fitting in the valve body is leaking, do not over-tighten in an effort to stop leak. This will distort body casting and cause spools to bind. Instead, the plug and fitting should be removed from valve body and be reconnected, using a new O-ring. Do not apply excessive pressure on mounting bolts.
Sticky valve spool.	Paint on valve spool; sticking valve spool or scored valve spool	Clean valve spool. Binding is usually caused from an over tightened plug, mounting bolt, fitting in valve body or tie rod bolt. If a plug or fitting in the valve body is leaking, do not over-tighten in an effort to stop leak. This will distort body casting and cause spools to bind. Instead, the plug and fitting should be removed from valve body and be reconnected, using a new O-ring. Do not apply excessive pressure on mounting bolts.

Problem	Cause	Correction
Sticky valve spool.	Bent spool	Replace with new spool section
	Foreign particles	Clean system and valve
	Misalignment of control handle linkage	Check linkage for binding condition
Unable to push valve spool in.	Paint on valve spool; sticking valve spool or scored valve spool	Clean valve spool. Binding is usually caused from an over tightened plug, mounting bolt, fitting in valve body or tie rod bolt. If a plug or fitting in the valve body is leaking, do not over-tighten in an effort to stop leak. This will distort body casting and cause spools to bind. Instead, the plug and fitting should be removed from valve body and be reconnected, using a new O-ring. Do not apply excessive pressure on mounting bolts.
	Oil leakage past spool seal into spool cap	Remove cap. If it contains oil replace spool seal O-rings. Check O-ring retainer to be sure it is flat. If it has been "belled" check for restriction from outlet to reservoir of valve which would cause excessive back pressure. If supply and return lines are reversed, pressure on low pressure / return side of valve will cause problem. Make sure hoses are connected correctly at bulkhead connection on backhoe.
	Bent spool	Replace with new spool section
	Foreign particles	Clean system and valve
	Misalignment of control handle linkage	Check linkage for binding condition
Spring centered spools do not return to neutral.	Paint on valve spool; sticking valve spool or scored valve spool	Clean valve spool. Binding is usually caused from an over tightened plug, mounting bolt, fitting in valve body or tie rod bolt. If a plug or fitting in the valve body is leaking, do not over-tighten in an effort to stop leak. This will distort body casting and cause spools to bind. Instead, the plug and fitting should be removed from valve body and be reconnected, using a new O-ring. Do not apply excessive pressure on mounting bolts.
	Oil leakage past spool seal into spool cap	Remove cap. If it contains oil replace spool seal O-rings. Check O-ring retainer to be sure it is flat. If it has been "belled" check for restriction from outlet to reservoir of valve which would cause excessive back pressure. If supply and return lines are reversed, pressure on low pressure / return side of valve will cause problem. Make sure hoses are connected correctly at bulkhead connection on backhoe.
	Broken return springs	Replace springs
	Bent spool	Replace with new spool section
	Foreign particles	Clean system and valve
	Misalignment of control handle linkage	Check linkage for binding condition
Damage to Swing Cylinder. (Not covered under warranty)	Swing Chain adjusted incorrectly.	Repair damaged cylinder and adjust swing chains as specified in this manual.
Sheared Attachment bolts. (Not covered under warranty)	Contact between Cylinder Lugs and Swing Frame Tube or contact between Chain Adjustment Lug and Cylinder Lug.	Replace sheared attachment bolt and adjust swing chains as specified in this manual.
	Normal Wear.	Service Attaching Bolts as specified in this manual.
Swing cylinder does not operate.	Contamination in orifice fitting and/or cylinder check valve.	Clean hydraulic system, remove and clean orifice fitting and/or cylinder check valve. If damaged replace.

Monarch Swing Cylinder Trouble Shooting

Problem	Cause	Correction
Seal Leakage Internal / External. (see illustration below)	Oil contamination.	Clean system and cylinder.
	Continuous excessive pressures over 3000 PSI or spiking over 6000 PSI.	Check entire hydraulic system. Relieve condition. Check for pinched hoses. Replace any damaged hoses or components. Replace or rebuild cylinder; replace damaged parts.
	Excessive heat above 175°F (70°C).	Check entire hydraulic system. Relieve condition. Check for pinched hoses. Replace any damaged hoses or components. Replace or rebuild cylinder; replace damaged parts.
	Bent, rusted, or dented rod.	Replace or rebuild cylinder; replace damaged parts.
Non-responsive cushioning.	Oil contamination.	Relieve condition. Clean system and cylinder.
	Check piston seals.	Replace or rebuild cylinder; replace damaged parts.
	Inspect Check valves for contamination (Item #31).	Clean or replace check valve.
	Check tube I.D. for scoring.	Clean system and cylinder and check valves.
	Check hydraulic system settings.	Check entire hydraulic system. Relieve condition. Check for pinched hoses. Replace any damaged hoses or components. Replace or rebuild cylinder; replace damaged parts.
	Check hydraulic system pressure settings.	Clean relief carefully but do not disturb its pressure setting as it cannot be field calibrated, or replace cartridge.



Ref.	Description	Ref.	Description	Ref.	Description	Ref.	Description
1	Tube Assembly	10	O-Ring	14	3-Piece Seal	22	Rod Retaining Ring
2	Gland / Head	10A	Rod O-Ring	14A	U-Cup Piston Seal	31	Check Valve
3	Piston	11	U-Cup Seal	20	Internal Retaining Ring	40	Back Up Seal
4	Piston Rod	13	Wiper Seal	21	External Retaining Ring		

14. TORQUE CHART

SAE FASTENER TORQUE CHART

NOTE: Use these torques, unless special torques are specified. Values are for UNC and UNF thread fasteners, plated or unplated, as received from supplier. Fasteners can be dry or lubricated with normal engine oil. Values do not apply if graphite, moly-disulphide or other extreme pressure lubricant is used.

SAE Grade No.	2				5				8*			
Bolt head identification (See Note 1)												
Bolt Size	LB FT		Nm		LB FT		Nm		LB FT		Nm	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
1/4	5	6	7	8	9	11	12	15	12	15	16	20
5/16	10	12	14	16	17	20.5	23	28	24	29	33	39
3/8	20	23	27	31	35	42	48	57	45	54	61	73
7/16	30	35	41	47	54	64	73	87	70	84	95	114
1/2	45	52	61	70	80	96	109	130	110	132	149	179
9/16	65	75	88	102	110	132	149	179	160	192	217	260
5/8	95	105	129	142	150	180	203	244	220	264	298	358
3/4	150	185	203	251	270	324	366	439	380	456	515	618
7/8	160	200	217	271	400	480	542	651	600	720	814	976
1	250	300	339	406	580	696	787	944	900	1080	1220	1464
1-1/8					800	880	1085	1193	1280	1440	1736	1953
1-1/4					1120	1240	1519	1681	1820	2000	2468	2712
1-3/8					1460	1680	1980	2278	2380	2720	3227	3688
1-1/2					1940	2200	2631	2983	3160	3560	4285	4827

NOTE 1: Bolt head identification marks as per grade. Manufacturing marks will vary. *Thick nuts must be used with Grade 8 bolts

METRIC FASTENER (ISO) TORQUE CHART

NOTE: Use these torques, unless special torques are specified. Values are for course thread fasteners, plated or unplated, as received from supplier. Fasteners can be dry or lubricated with normal engine oil. Values do not apply if graphite, moly-disulphide or other extreme pressure lubricant is used.

ISO Class No.	8.8				10.9				12.9			
Bolt head identification (See Note 1)												
Bolt Size	Nm		LB FT		Nm		LB FT		Nm		LB FT	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
M4	3	4	2	3	4	5	3	4				
M5	6.5	8	5	6	9.5	11	7	8				
M6	10.5	12	8	9	15	17.5	11	13				
M8	26	31	19	23	37	43	27	32				
M10	52	61	38	45	73	87	54	64				
M12	90	107	66	79	125	150	93	112				
*M14	144	172	106	127	200	245	149	179				
M16	217	271	160	200	310	380	230	280				
M20	434	515	320	380	610	730	450	540				
M24	675	815	500	600	1050	1275	780	940				
M30	1250	1500	920	1100	2000	2400	1470	1770				
M36	2175	2600	1600	1950	3500	4200	2580	3090				

Because of the low ductility of these fasteners, the torque range is to be determined individually for each application. As a general rule, the torque ranges specified for grade 10.9 fasteners can be used satisfactorily on 12.9 fasteners.

*M14 is not a preferred size

NOTE 1: Bolt head identification marks as per grade. Manufacturing marks will vary

15. NOTES

16. PARTS MANUAL

Illustrations

All parts are illustrated in "exploded views" which show the individual parts in their normal relationship to each other. Reference numbers are used in the illustrations. These numbers correspond to those in the "Reference Number" column and are followed by the quantity required and description.

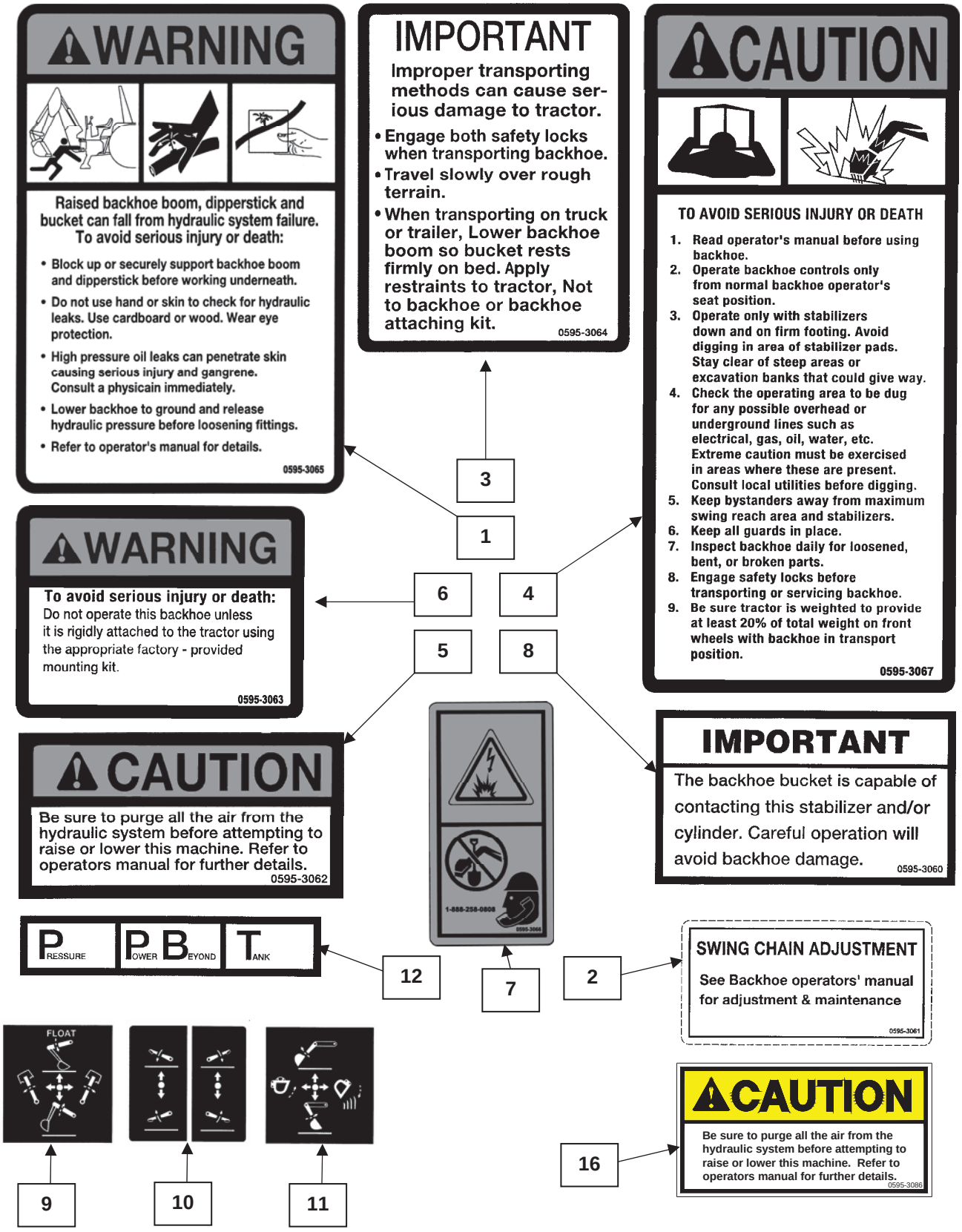
Directional Reference

Right hand (RH) and left hand (LH) sides are determined by sitting on the backhoe seat and facing towards the backhoe.

Parts Order

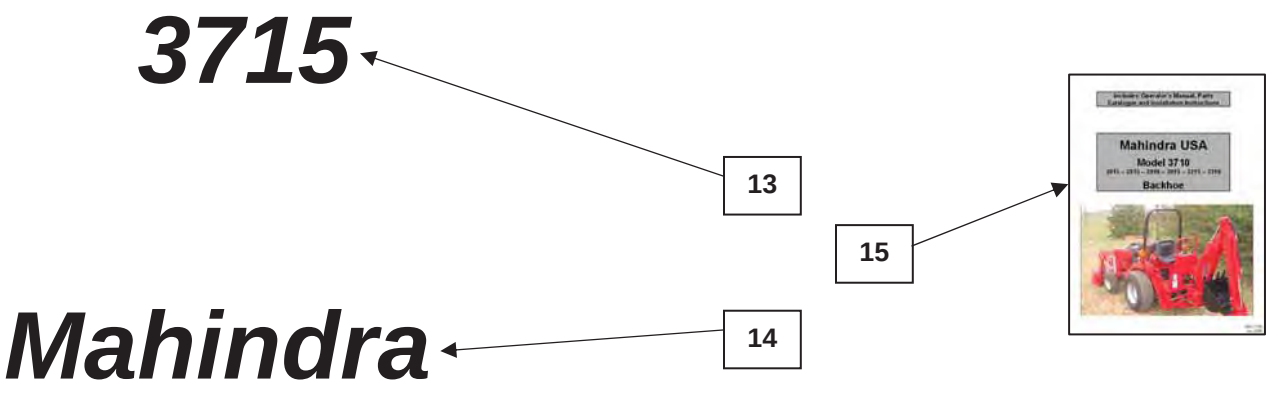
Orders must give the complete description, correct part number, the total amount required, the product model, all the necessary serial numbers, the method of shipment and the shipping address.

17. DECALS


WARNING
Raised backhoe boom, dipperstick and bucket can fall from hydraulic system failure. To avoid serious injury or death:
• Block up or securely support backhoe boom and dipperstick before working underneath.
• Do not use hand or skin to check for hydraulic leaks. Use cardboard or wood. Wear eye protection.
• High pressure oil leaks can penetrate skin causing serious injury and gangrene. Consult a physicain immediately.
• Lower backhoe to ground and release hydraulic pressure before loosening fittings.
• Refer to operator's manual for details.
0595-3065
IMPORTANT
Improper transporting methods can cause serious damage to tractor.
• Engage both safety locks when transporting backhoe.
• Travel slowly over rough terrain.
• When transporting on truck or trailer, Lower backhoe boom so bucket rests firmly on bed. Apply restraints to tractor, Not to backhoe or backhoe attaching kit.
0595-3064
CAUTION
TO AVOID SERIOUS INJURY OR DEATH
1. Read operator's manual before using backhoe.
2. Operate backhoe controls only from normal backhoe operator's seat position.
3. Operate only with stabilizers down and on firm footing. Avoid digging in area of stabilizer pads. Stay clear of steep areas or excavation banks that could give way.
4. Check the operating area to be dug for any possible overhead or underground lines such as electrical, gas, oil, water, etc. Extreme caution must be exercised in areas where these are present. Consult local utilities before digging.
5. Keep bystanders away from maximum swing reach area and stabilizers.
6. Keep all guards in place.
7. Inspect backhoe daily for loosened, bent, or broken parts.
8. Engage safety locks before transporting or servicing backhoe.
9. Be sure tractor is weighted to provide at least 20% of total weight on front wheels with backhoe in transport position.
0595-3067
3
1
WARNING
To avoid serious injury or death:
Do not operate this backhoe unless it is rigidly attached to the tractor using the appropriate factory - provided mounting kit.
0595-3063
6
4
5
8
CAUTION
Be sure to purge all the air from the hydraulic system before attempting to raise or lower this machine. Refer to operators manual for further details.
0595-3062
IMPORTANT
The backhoe bucket is capable of contacting this stabilizer and/or cylinder. Careful operation will avoid backhoe damage.
0595-3060
PRESSURE
POWER BEYOND
TANK
12
7
2
SWING CHAIN ADJUSTMENT
See Backhoe operators' manual for adjustment & maintenance
0595-3061
FLOAT
9
10
11
CAUTION
Be sure to purge all the air from the hydraulic system before attempting to raise or lower this machine. Refer to operators manual for further details.
0595-3086
16

DECALS

Reference	Description	Part No.	Qty.
1	Decal, Warning	0595-3065	1
2	Decal, Instruction	0595-3061	1
3	Decal, Important	0595-3064	1
4	Decal, Caution	0595-3067	1
5	Decal, Caution	0595-3062	1
6	Decal, Warning	0595-3063	1
7	Decal, Instruction	0595-3066	1
8	Decal, Important	0595-3060	2
9	Decal, Float	0595-3114	1
10	Decal, Stabilizer	0595-3115	2
11	Decal, Bucket	0595-3116	1
12	Decal, Pressure	0595-3058	1
13	Decal, Model 3715	0595-31917	2
14	Decal, Mahindra	0595-3006	2
15	Operator's Manual	1503-1203	1
16	Decal, Caution	0595-3086	1
17	Decal, Service Note	0595-3176	1

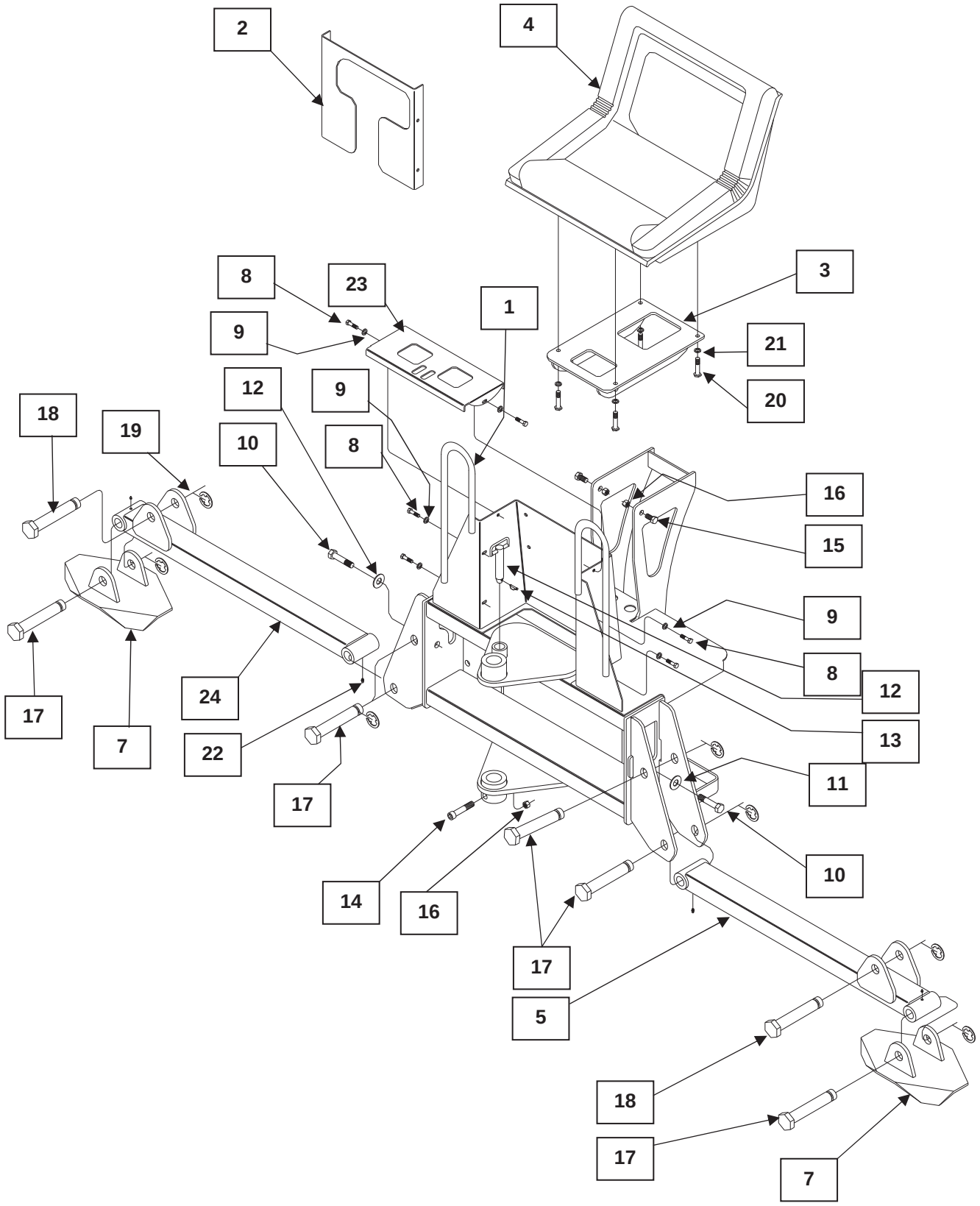


SERVICE NOTE:
At every 50 hours of backhoe operation, replace the hardware that secures the swing chains to the swing cylinder. Use 3/8" 16NC x 1 3/4" Grd. 8 bolts, torque to max. of 54 ft. lbs.

0595-3176

17

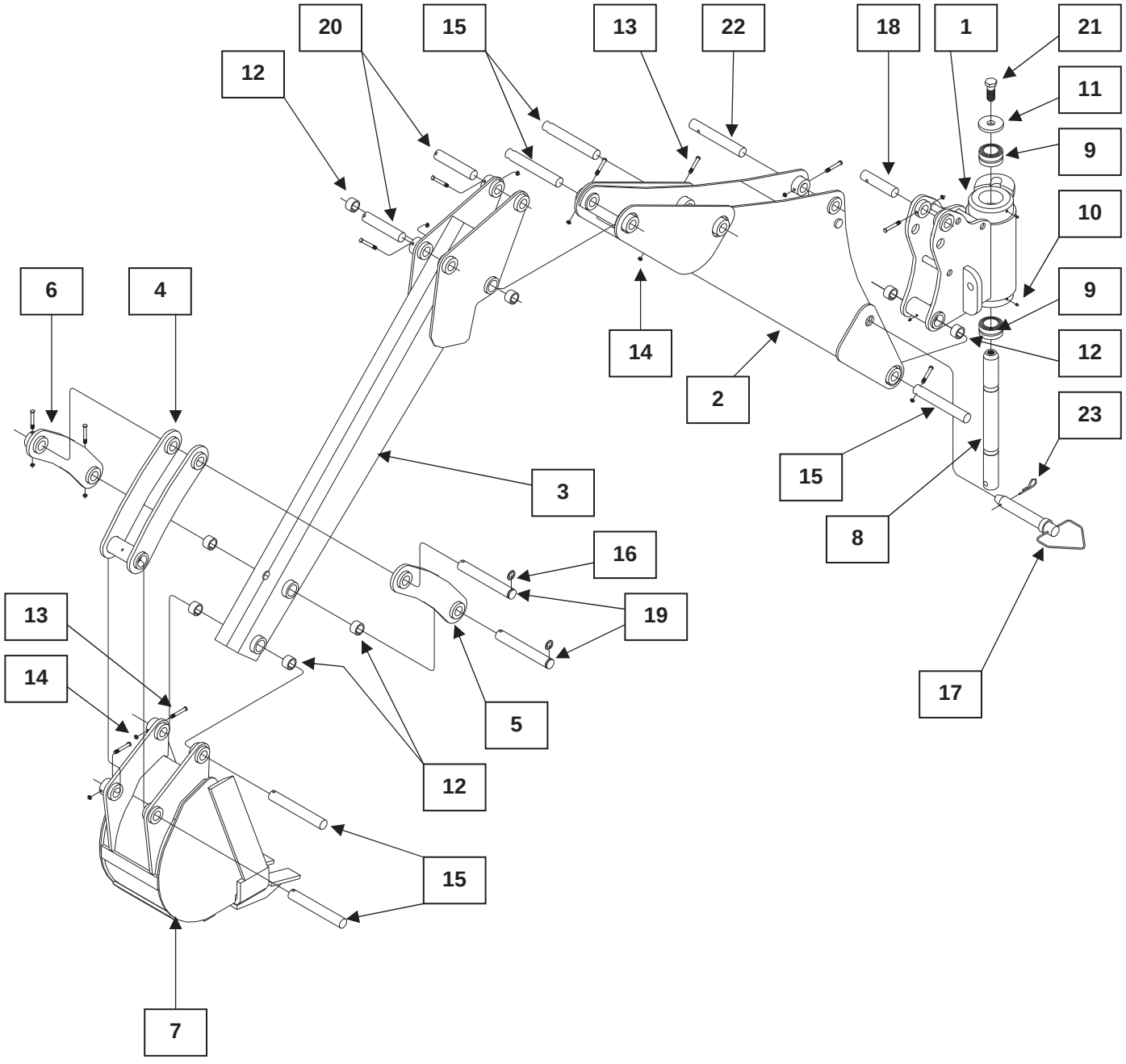
18. BACKHOE FRAME AND HARDWARE



BACKHOE FRAME AND HARDWARE

Reference	Description	Part No.	Qty.
1	Mainframe Assembly	6100-1008	1
2	Valve Cover Plate Assembly	6104-1007	1
3	Seat Bracket Assembly	6106-1019	1
4	Seat	6106-1015	1
5	Stabilizer Assembly, LH	6400-1001	1
7	Stabilizer Pad Assembly	6402-1001	2
8	Hex Head Cap Screw ¼”-20 x.75” GR 5	0545-2003	6
9	Lock Washer, ¼”	0544-2008	6
10	Socket Head Cap Screw 5/8”-11 x 1.50” GR 8	0564-2164	2
11	Flat Washer, 5/8”	0540-2004	2
12	Latch Pin	0551-3040	1
13	¼” x 1.75” Lynch Pin	0553-4503	1
14	Socket Head Cap Screw 1/2”-13 x 3.50”	0564-2114	1
15	Hex Head Cap Screw ½”-13 x 1.25” GR5	0545-2105	2
16	Dimpled Locknut, ½”	0555-2136	3
17	1.00” x 4.750” Pivot Pin	0550-4754	6
18	1.00” x 4.250” Pivot Pin	0550-4253	2
19	19mm x 1.75” Pivot Pin Clip	0560-1035	8
20	Hex Head Cap Screw 5/16”-18 x 0.75” GR5	0545-2024	4
21	Lock Washer, 5/16”	0544-2009	4
22	¼”-28 Grease Fitting-Str.	0530-1038	8
23	Handle Cover Plate Assembly	6101-1063	1
24	Stabilizer Assembly, RH	6400-1002	1

19. BACKHOE BOOM AND HARDWARE

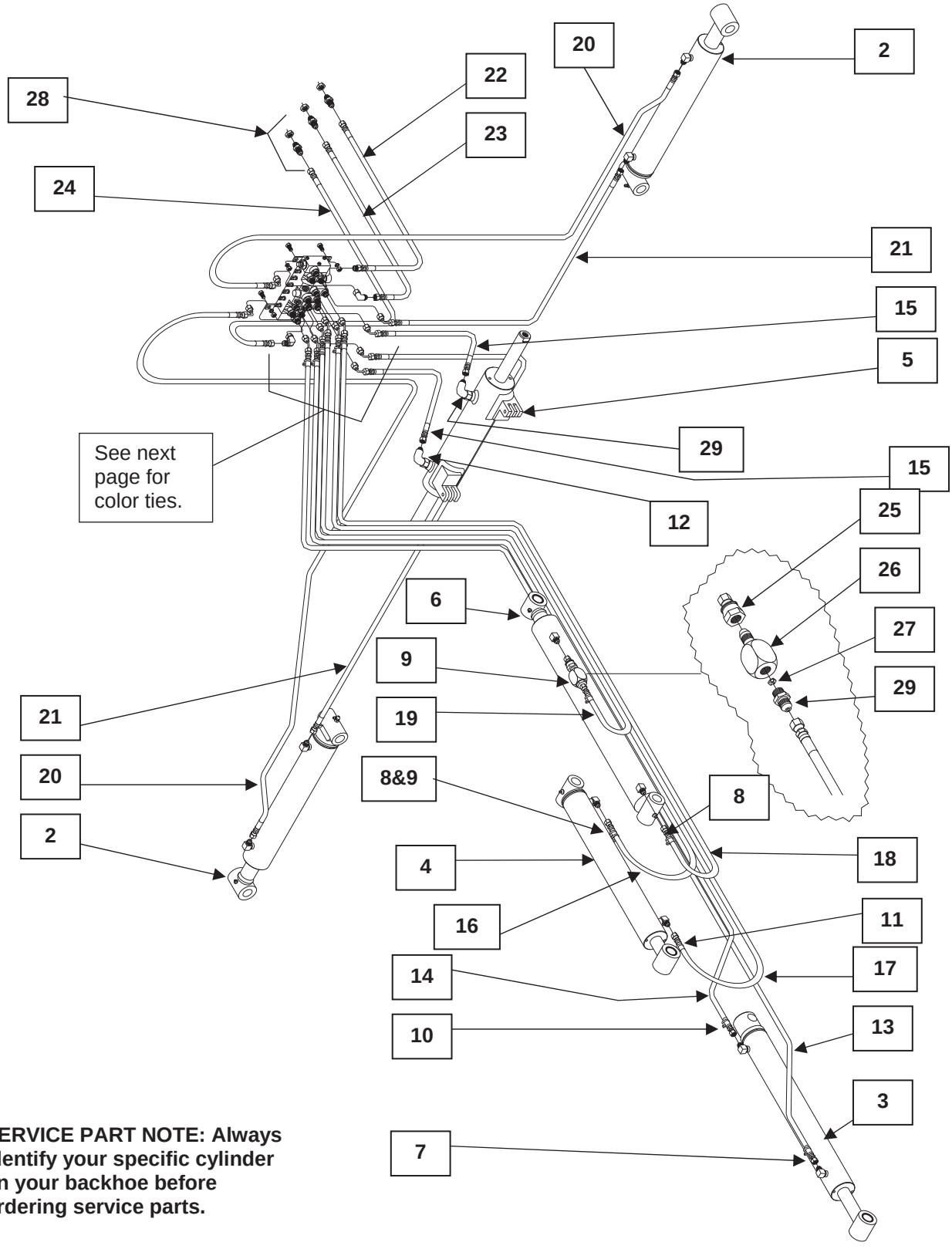


BACKHOE BOOM AND HARDWARE

Reference	Description	Part No.	Qty.
1	Swing Assembly	6102-1039	1
2	Boom Assembly	6200-1005	1
3	Dipper Stick Assembly	6300-1003	1
4	Bucket Link Assembly	6709-1010	1
5	Dipper Link Assembly, LH	6709-1012	1
6	Dipper Link Assembly, RH	6709-1013	1
7	Bucket Assembly	6702-1015	1
8	King Pin	6102-1040	1
9	Spherical Bearing, 1.5”	0310-2003	2
10	0.25-28 Grease Fitting-Str	0530-1038	4
11	Washer Special	6102-1041	1
12	Bushing, Replaceable	0310-2004	8
13	0.25-20 x 2.25 HHCS GR8	0548-2010	11
14	0.25-20 Hex Head Stover Lock Nut	0546-1041	11
15	1.00 x 7.40” Pin	0550-9740	5
16	19mm x 1.75mm Pivot Pin Clip	0560-1035	4
17	Latch Pin	0551-3043	1
18	1.00 x 4.50” Pin	0550-9447	1
19	1.00 x 7.625” Pin	0550-9764	2
20	1.00 x 5.375” Pin	0550-9536	2
21	0.75-16 x 1.50 HHCS GR5, ZP	0545-2613	1
22	1.00 x 5.80” Pin	0550-9581	1
23	Hairpin	NSS	1

NSS – Not Serviceable Separately

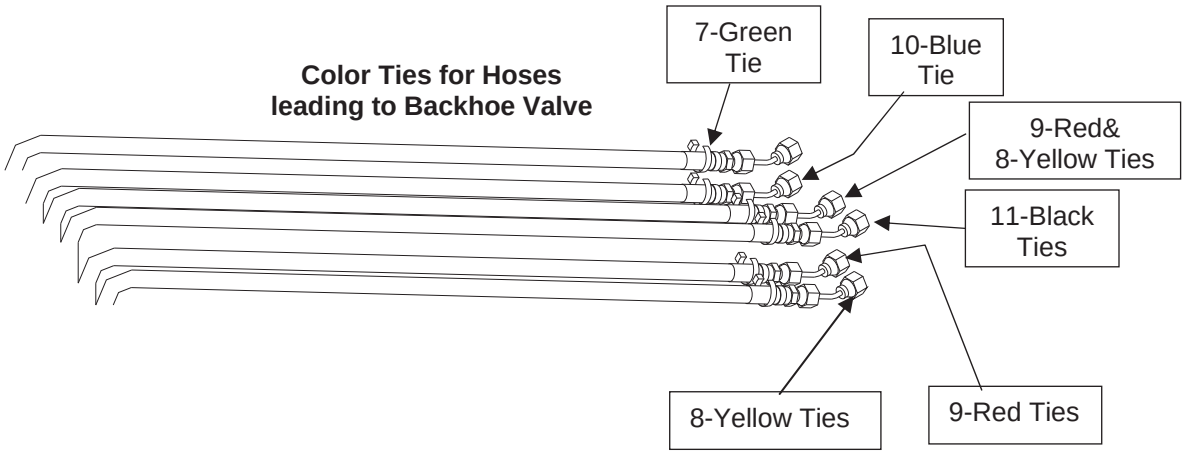
20. CYLINDER, HOSES AND FITTINGS



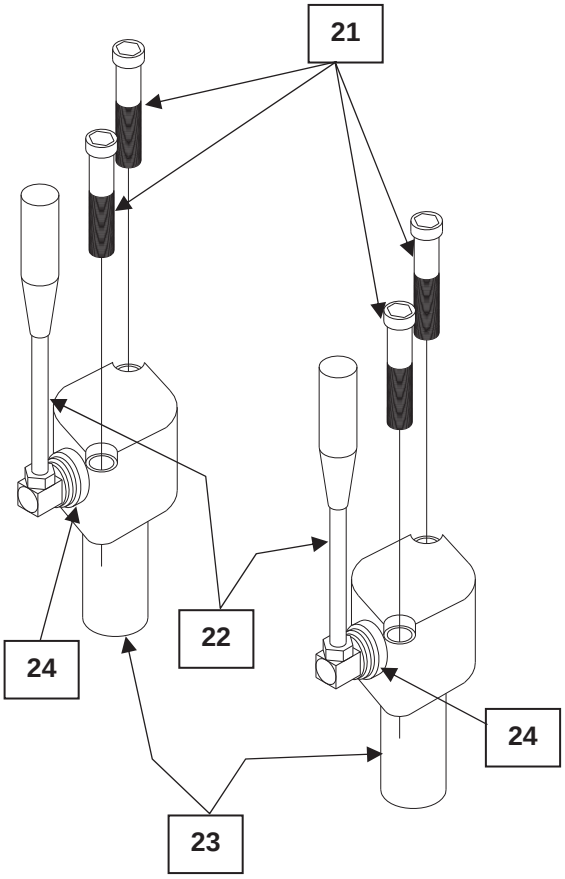
SERVICE PART NOTE: Always identify your specific cylinder on your backhoe before ordering service parts.

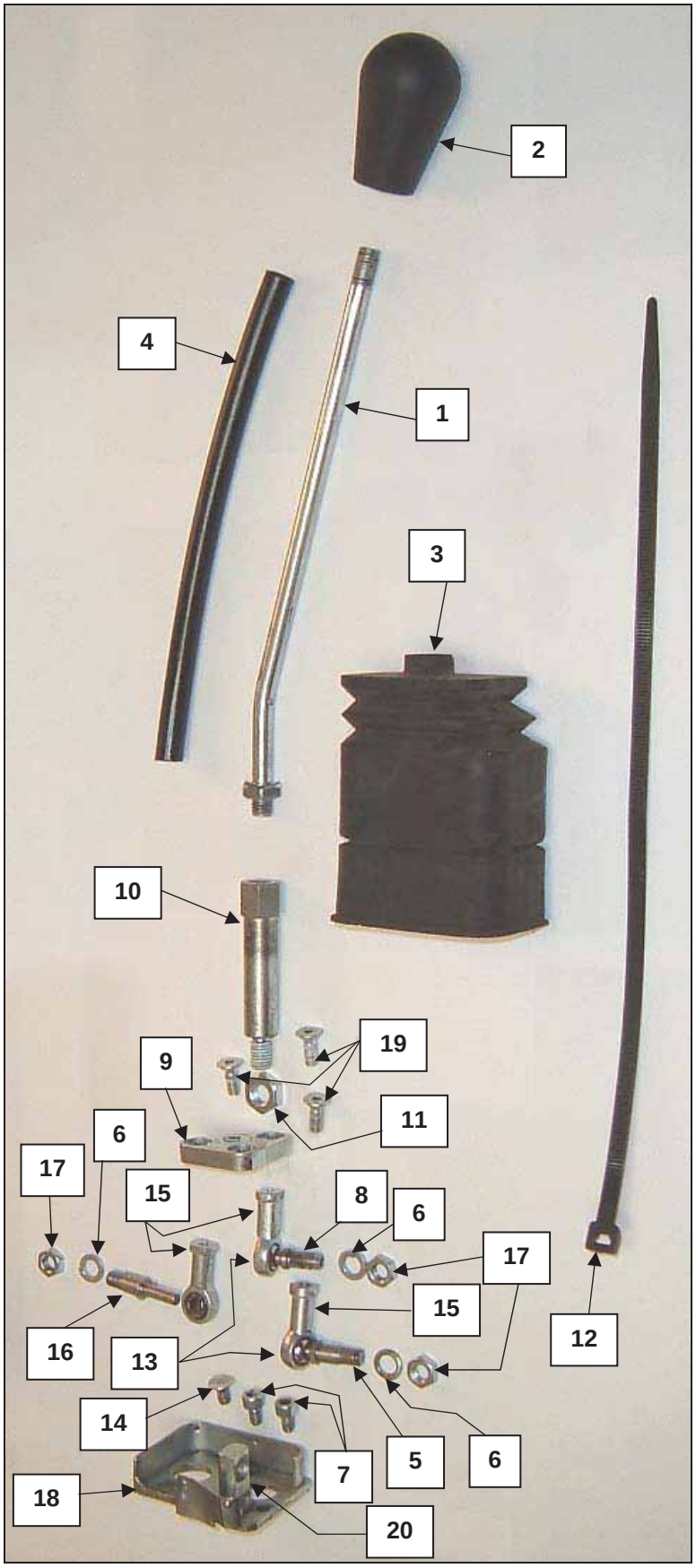
CYLINDER, HOSES AND FITTINGS

Reference	Description	Part No.	Qty.
1	Hyd. Hose Kit Assembly (All Hoses)	6602-1006	1
2	Hydraulic Cylinder	3170-2020	2
3	Hydraulic Cylinder	3170-2021	1
4	Hydraulic Cylinder	3170-2022	1
5	Hydraulic Cylinder	1590-2067	1
6	Hydraulic Cylinder	3170-2024	1
7	Color Code Tie Strap, Green	0554-2004	2
8	Color Code Tie Strap, Yellow	0554-2003	4
9	Color Code Tie Strap, Red	0554-2002	4
10	Color Code Tie Strap, Blue	0554-2001	2
11	Plastic Tie Strap	0554-1013	2
12	Fitting		
13	Hose	0582-1506526128	1
14	Hose	0582-1506526108	1
15	Hose	0582-1506886030	2
16	Hose	0582-1506526106	1
17	Hose	0582-1506526087	1
18	Hose	0582-1506526090	1
19	Hose	0582-1506526110	1
20	Hose	0582-1506886053	2
21	Hose	0582-1506886025	2
22	Hose	0582-2128508014	1
23	Hose	0582-2508508016	1
24	Hose	0582-2508508040	1
25	Hyd. Adapter, 180 Deg	0586-1506-508…	1
26	Hyd. Adapter	0586-3007	1
27	Adapter Orifice Plate	0580-6074	1
28	Bulkhead Fitting	0586-3008	3
28	Fitting Straight	0586-1108-406	1
29	Fitting Straight		



21. CONTROL HANDLE COMPONENTS

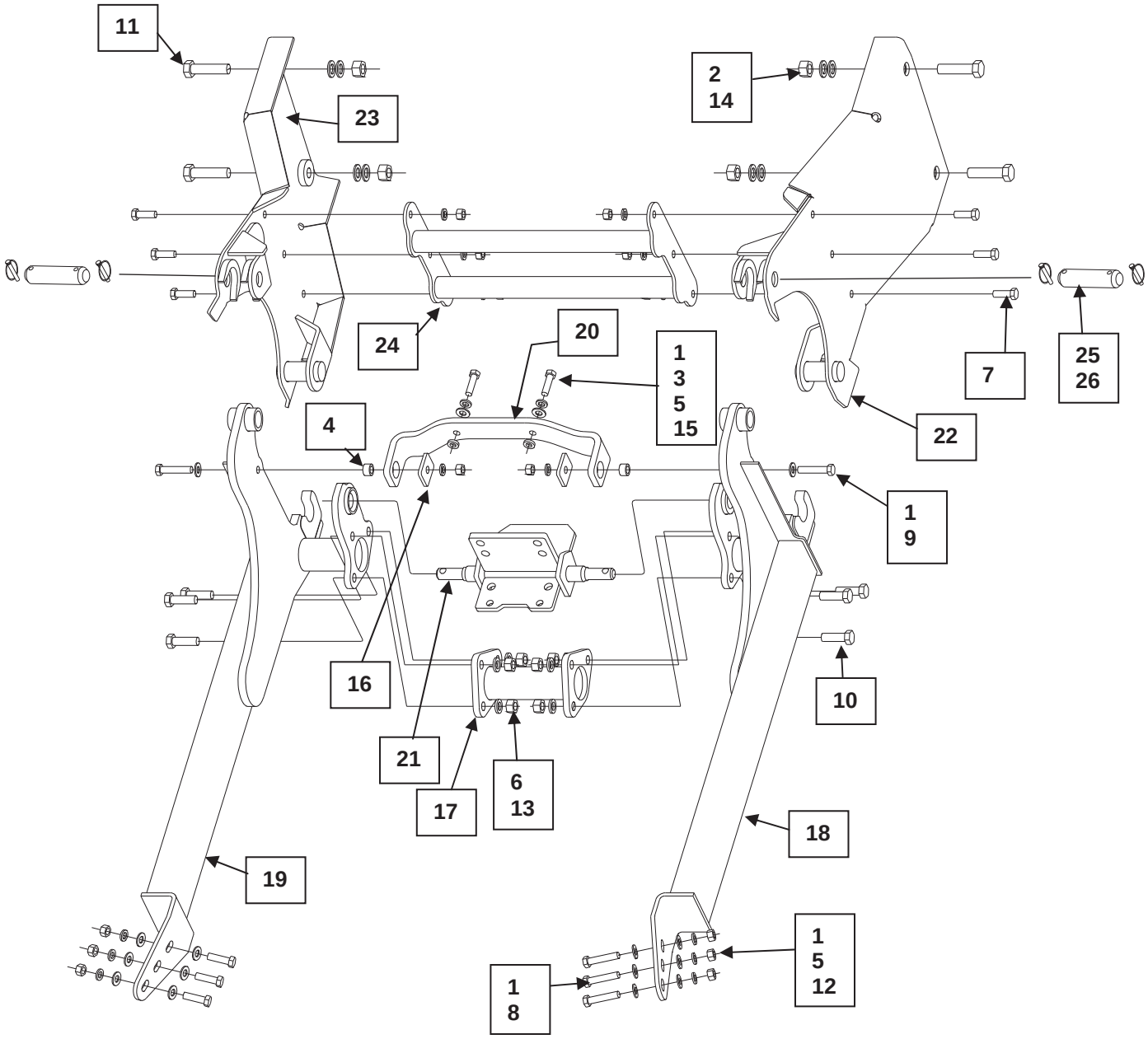




CONTROL HANDLE COMPONENTS

Reference	Description	Part No.	Qty.
1	Joystick Handle w/ Nut	1409-3134	1
2	Knob	1409-3129	1
3	Control Handle Boot	1409-3136	1
4	Rod Handle Cover	1409-3133	1
5	Pivot Pin	1409-3139	1
6	Lockwasher M8	1409-3137	3
7	Allen Head Screw M6 x 10	1409-3138	2
8	Pivot Pin	1409-3140	1
9	Handle Plate	1409-3141	1
10	Handle Coupler Nut	1409-3142	1
11	Nut M10	1409-3143	1
12	Zip Tie	1409-3144	1
13	Spring Clip (Located on ends of Pivot Pins)	1409-3145	2
14	Flat Allen Head Screw M6 x 10	1409-3146	1
15	Connector	1409-3147	3
16	Pivot Pin	1409-3148	1
17	Nut M8	1409-3149	3
18	Base Plate	1409-3150	1
19	Flat Allen Head Screw M6 x 16	1409-3151	3
20	Spool Eye	1409-3152	1
21	Allen Head Bolt	1409-3089	4
22	Handle Assembly	1409-3090	2
23	Handle Kit	1409-3091	2
24	Outrigger Control Boot	1409-3119	2

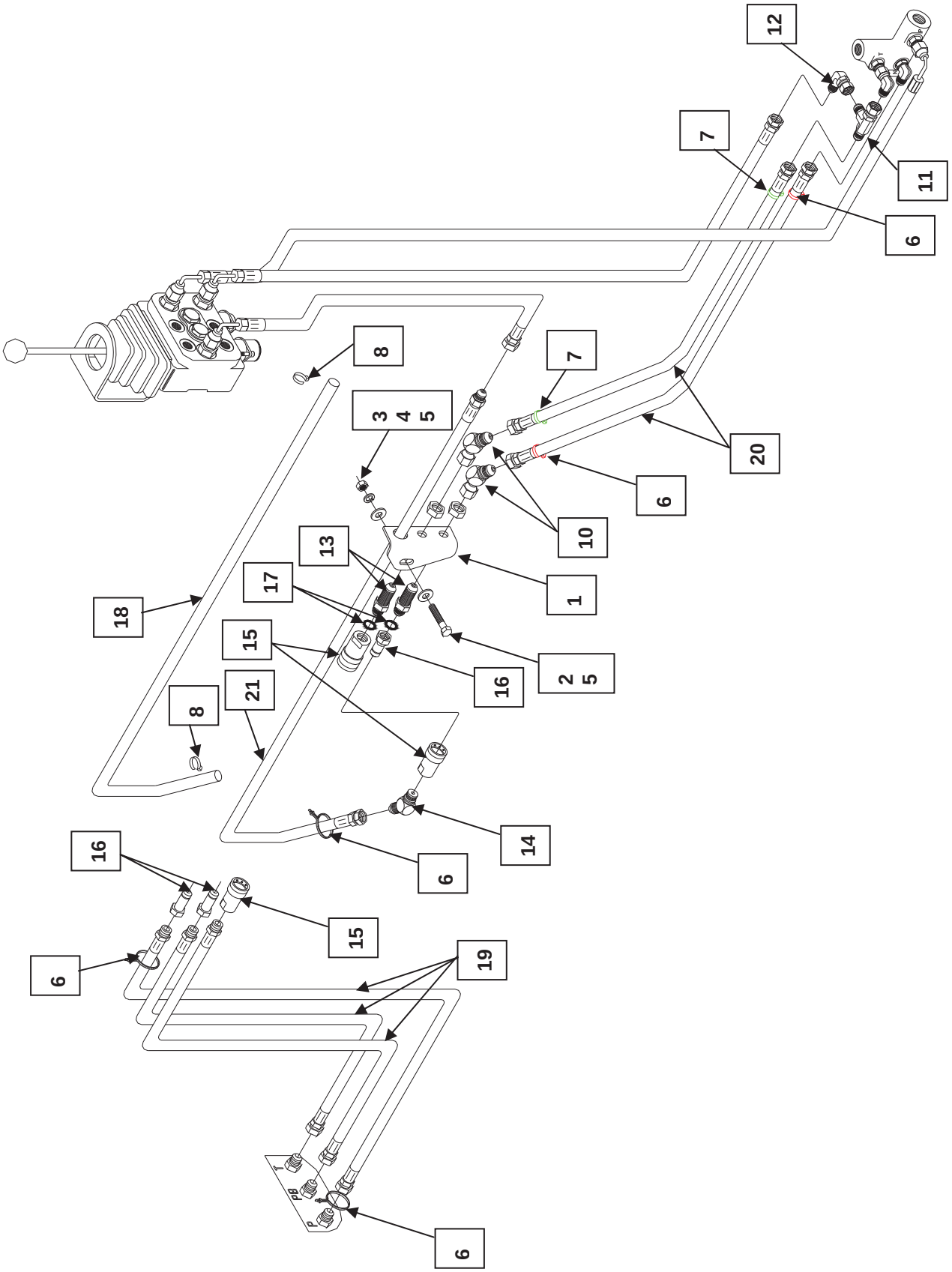
22. SUBFRAME



SUBFRAME

Reference	Description	Part No.	Qty.
1	Hardened Flatwasher ½”	0540-2003	16
2	Disc-Lock Washer ¾”	0540-2017	8
3	Spacer Bushing 3/16”	0541-3055	2
4	Spacer Bushing 17/32”	0541-3056	2
5	Lockwasher ½”	0544-2012	16
6	Lockwasher 5/8”	0544-2014	6
7	Hex Head Cap Screw ½”-13 x 1.5”	0545-2106	6
8	Hex Head Cap Screw ½”-13 x 1.75”	0545-2107	6
9	Hex Head Cap Screw ½”-13 x 2.5”	0545-2110	2
10	Hex Head Cap Screw 5/8”-11 x 2.0” Gr. 8	0548-2166	6
11	Hex Head Cap Screw ¾”-10 x 3.0” Gr. 8	0548-2234	4
12	Hex Head Nut ½”-13	0555-2004	14
13	Hex Head Nut 5/8”-11	0555-2006	6
14	Hex Head Nut ¾”-10	0555-2008	4
15	Hex Head Cap Screw 12-1.75 x 45 Gr. 10.9	0569-2124	2
16	Spacer Plate	1245-4178	2
17	Crossmember	6801-2068	1
18	RH Subframe Assembly	6801-2069	1
19	LH Subframe Assembly	6801-2070	1
20	Upper Crossmember	6801-2081	1
21	Rear Hitch Assembly	6802-2070	1
22	Subframe Extension Assembly, LH	6802-2072	1
23	Subframe Extension Assembly, RH	6802-2073	1
24	Extension Crossmember Assembly	6802-2084	1
25	Pin	0550-5062	2
26	Lynch Pin ¼” x 1.75”	0553-4503	2

23. HYDRAULIC ADAPTER & HOSE KIT

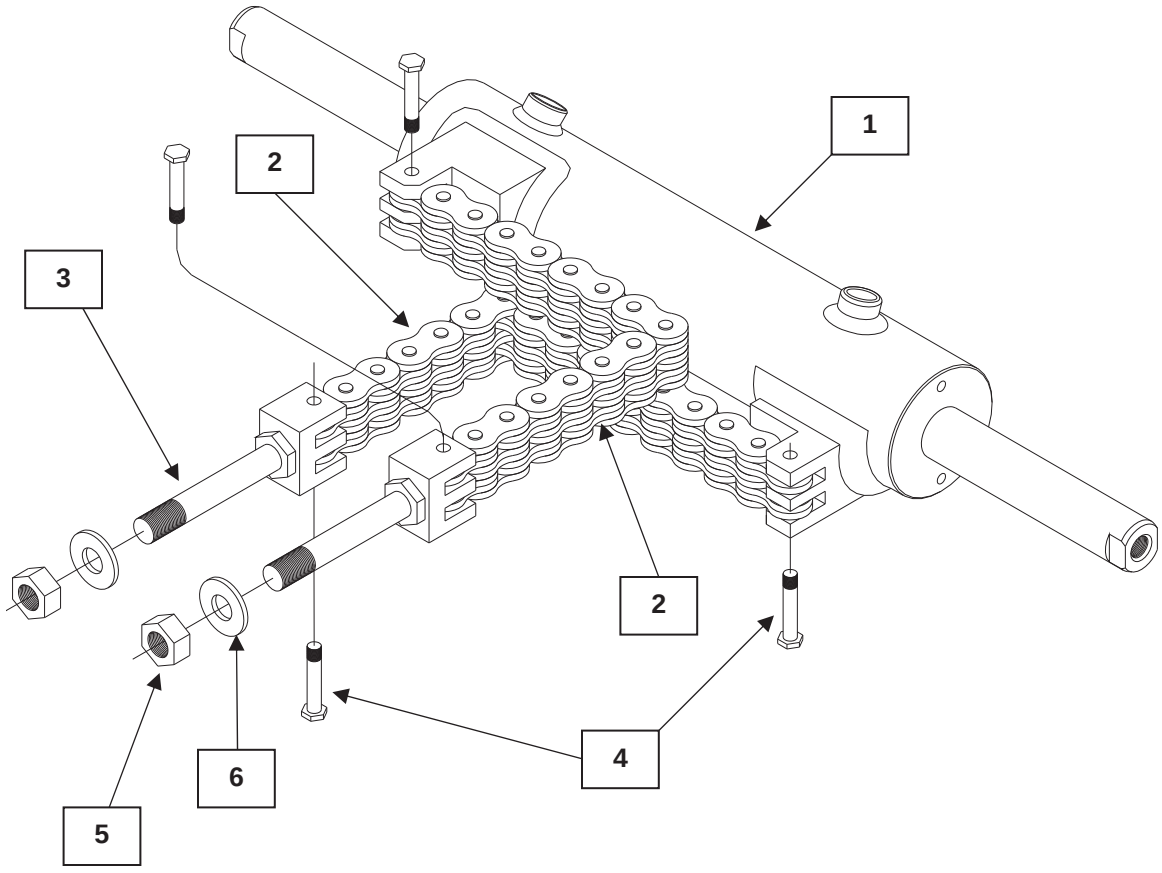


HYDRAULIC ADAPTER & HOSE KIT

Reference	Description	Part No.	Qty.
1	Quick Coupler Mount	1201-3195	1
2	Hex Head Cap Screw 12-1.25 x 50	0569-2360	1
3	Hex Head Nut 12-1.25	0559-2011	1
4	Lockwasher ½”	0544-2012	1
5	Hardened Flatwasher ½”	0540-2003	2
6	Color Code Tie Strap – Red	0554-2002	5
7	Color Code Tie Strap – Green	0554-2004	2
8	Color Code Tie Strap – Black	0554-2008	2
9	Plastic Tie Strap	0554-1013	2
10	Hydraulic Adapter 45°	0586-2406-506	2
11	Run Tee	0586-3031	1
12	Hydraulic Adapter 90°	0586-3406-506	1
13	Bulkhead Adapter	0586-3015	2
14	Hydraulic Adapter 45°	0586-2106-406	1
15	Female Quick Coupler	0580-6203	3
16	Male Quick Coupler	0580-6202	3
17	O-Ring	0520-3003	2
18	Hose Cover	0554-2044	1
19	Hydraulic Hose Assembly	0582-2106508036	3
20	Hydraulic Hose Assembly	0582-2506506059	2
21	Hydraulic Hose Assembly	0582-2406506029	1

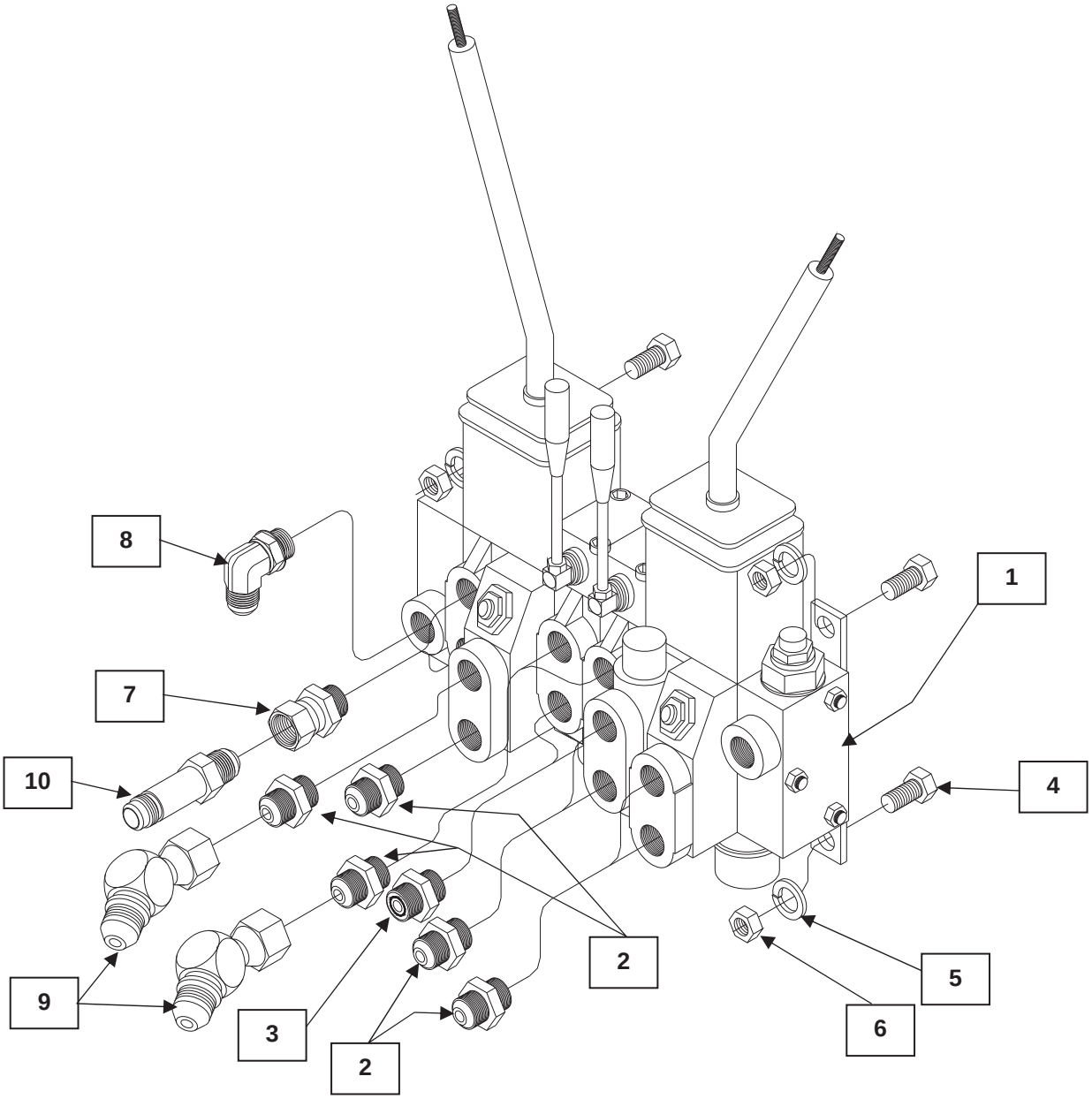
24. SWING CYLINDER AND HARDWARE

Reference	Description	Part No.	Qty.
1	Swing Cylinder Kit	1590-2067	1
2	Chain Assembly-Leaf Chain	6102-1036	2
3	Swing Chain Bolt, ZP	6102-1015	2
4	.375-16 x 1.75 HHCS GR8	0548-2054	4
5	0.75-10 Locknut, Nylon Insert, ZP	0555-2040	2
6	Washer	0543-2013	2



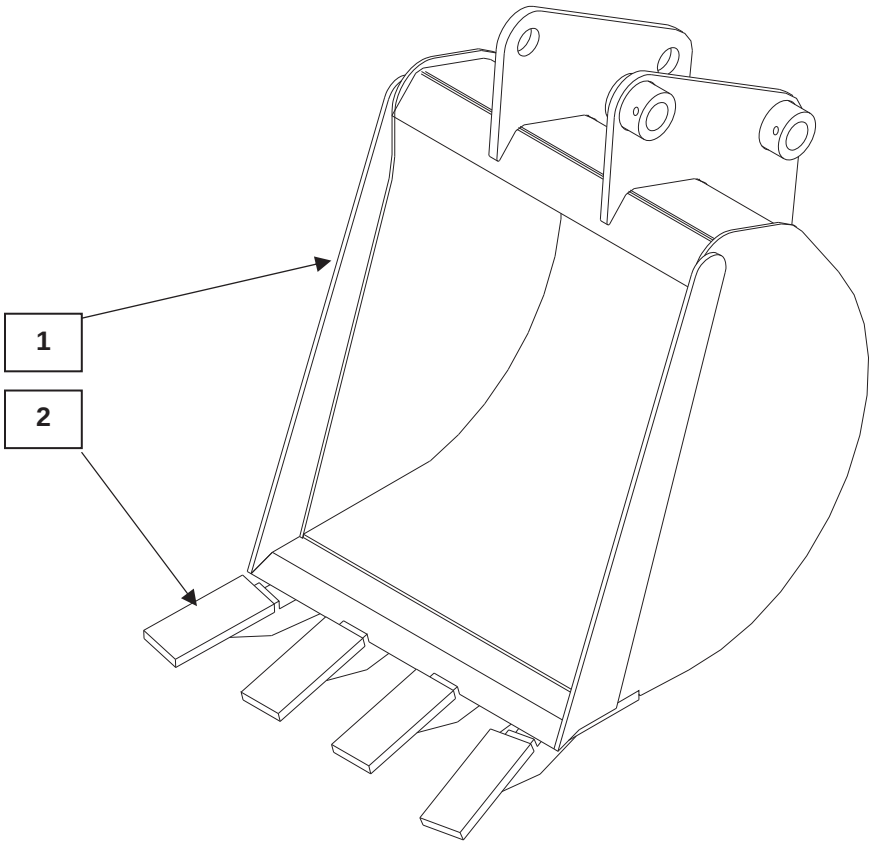
25. BACKHOE VALVE, FITTINGS, AND HARDWARE

Reference	Description	Part No.	Qty.
1	Backhoe Valve	0580-6284	1
2	Hydraulic Adapter, Straight	0586-1108-406	8
3	Hydraulic Adapter, Straight	0586-1108-826	2
4	Hex Head Cap Screw 5/16”-18 x 0.75” GR5	0545-2024	4
5	5/16” Lock Washer	0544-2009	4
6	Stover Hex Locknut 5/16”-18	0546-1121	4
7	Hydraulic Adapter, Straight	0586-1108-506	2
8	Hydraulic Adapter, 90°	0586-3108-408	1
9	Hydraulic Adapter, 45°	0586-2406-506	3
10	Bulkhead Fitting	0586-3015	2



26. BUCKET

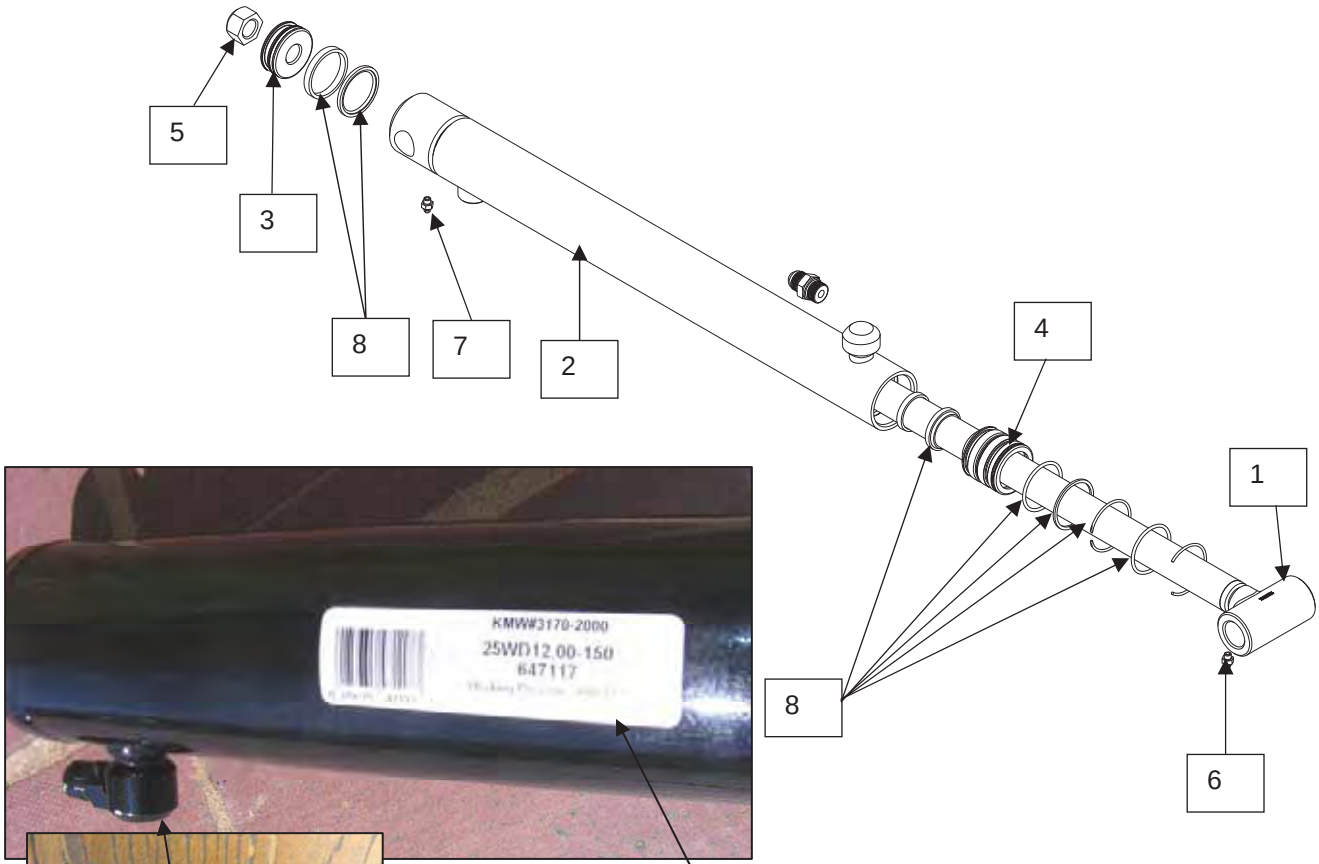
Reference	Description	Part No.	Qty.
1	Bucket Complete	Order through Wholegoods	1
2	Tooth, Replaceable	6702-1014	3 to 4



27. MONARCH CYLINDER (3170-2020)

Reference	Description	Part No.	Qty.
0	Cylinder (complete)	3170-2020	1
1	Rod Assembly	0200-2128	1
2	Tube Assembly	0100-2138	1
3	Piston	0405-2048	1
4	Gland	0330-2053	1
5	Locknut	0530-2022	1
6	Zerk	0530-2011	1
7	Zerk - 90º	0530-2014	1
8	Seal Kit	0590-2087	1

Replacement cylinder you receive may have a chrome or black nitro rod. Cylinder rod type will not affect backhoe performance.



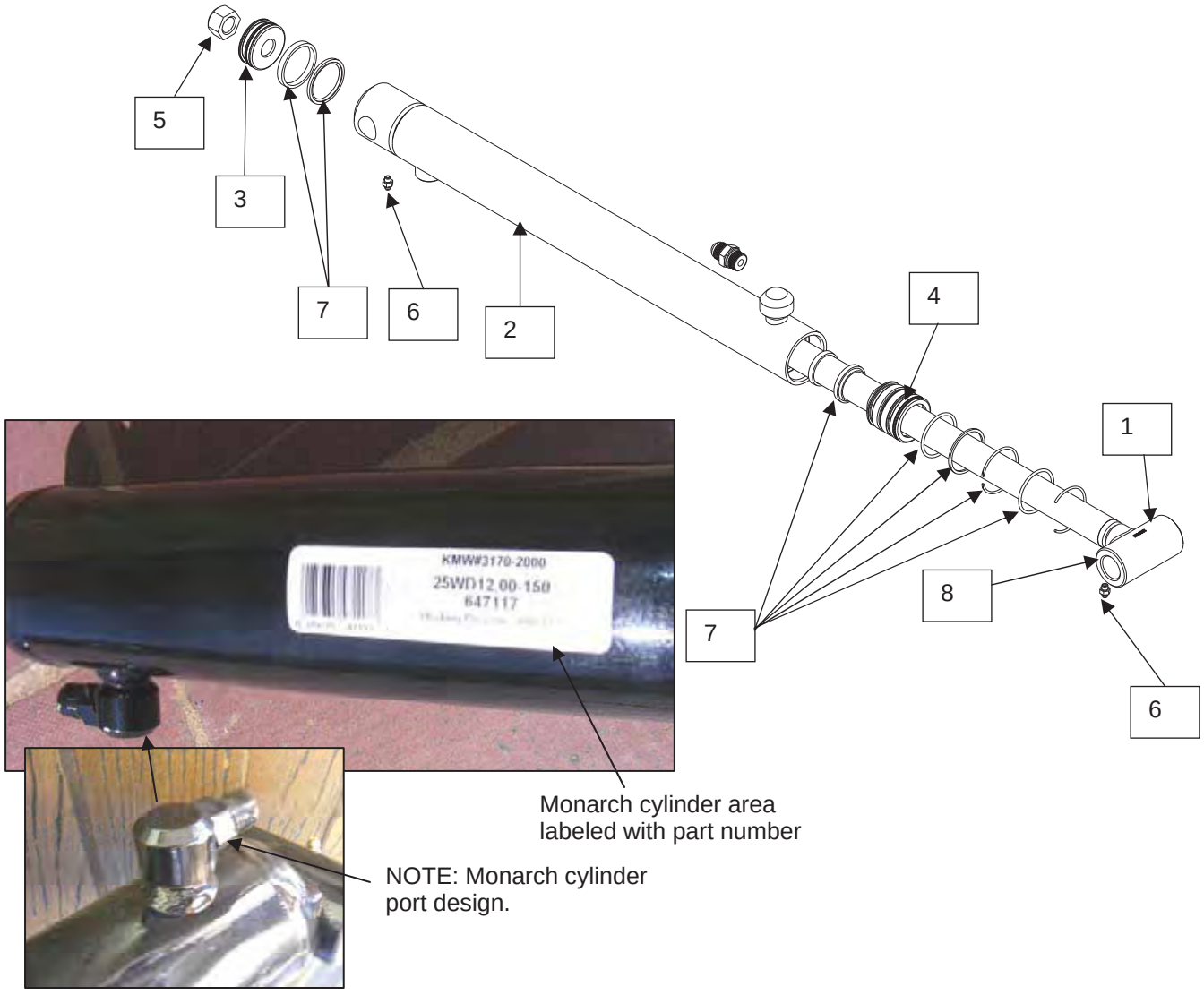
Monarch cylinder area labeled with part number

NOTE: Monarch cylinder port design.

28. MONARCH CYLINDER (3170-2021)

Reference	Description	Part No.	Qty.
0	Cylinder (complete)	3170-2021	1
1	Rod Assembly	0200-2127	1
2	Tube Assembly	0100-2137	1
3	Piston	0405-2047	1
4	Gland	0330-2052	1
5	Locknut	0530-2020	1
6	Zerk	0530-2011	2
7	Seal Kit	0590-2089	1
8	Hardened Inserts (Rod End)	0310-2009	2

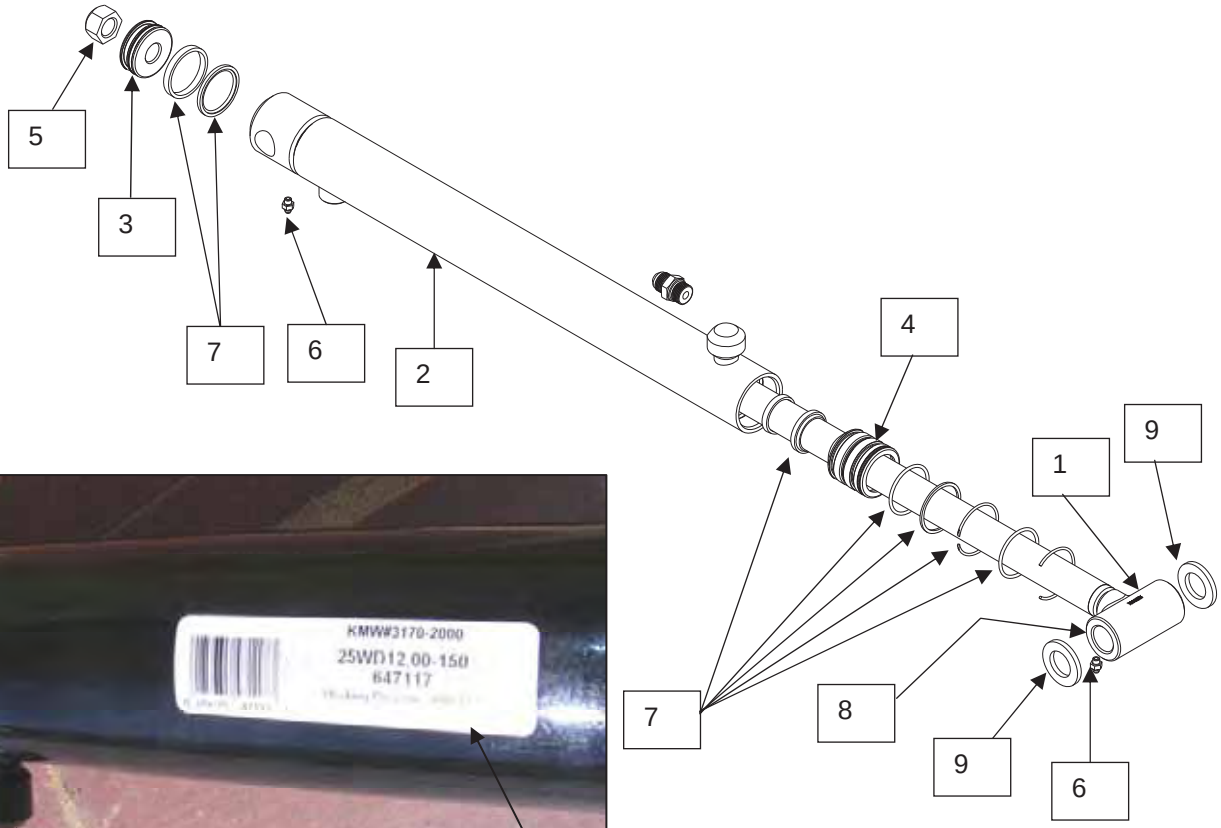
Replacement cylinder you receive may have a chrome or black nitro rod. Cylinder rod type will not affect backhoe performance.



29. MONARCH CYLINDER (3170-2022)

Reference	Description	Part No.	Qty.
0	Cylinder (complete)	3170-2022	1
1	Rod Assembly	0200-2126	1
2	Tube Assembly	0100-2136	1
3	Piston	0405-2047	1
4	Gland	0330-2052	1
5	Locknut	0530-2020	1
6	Zerk	0530-2011	2
7	Seal Kit	0590-2089	1
8	Hardened Inserts	0310-2009	2
9	Spacer Washer	0540-2024	2

Replacement cylinder you receive may have a chrome or black nitro rod. Cylinder rod type will not affect backhoe performance.

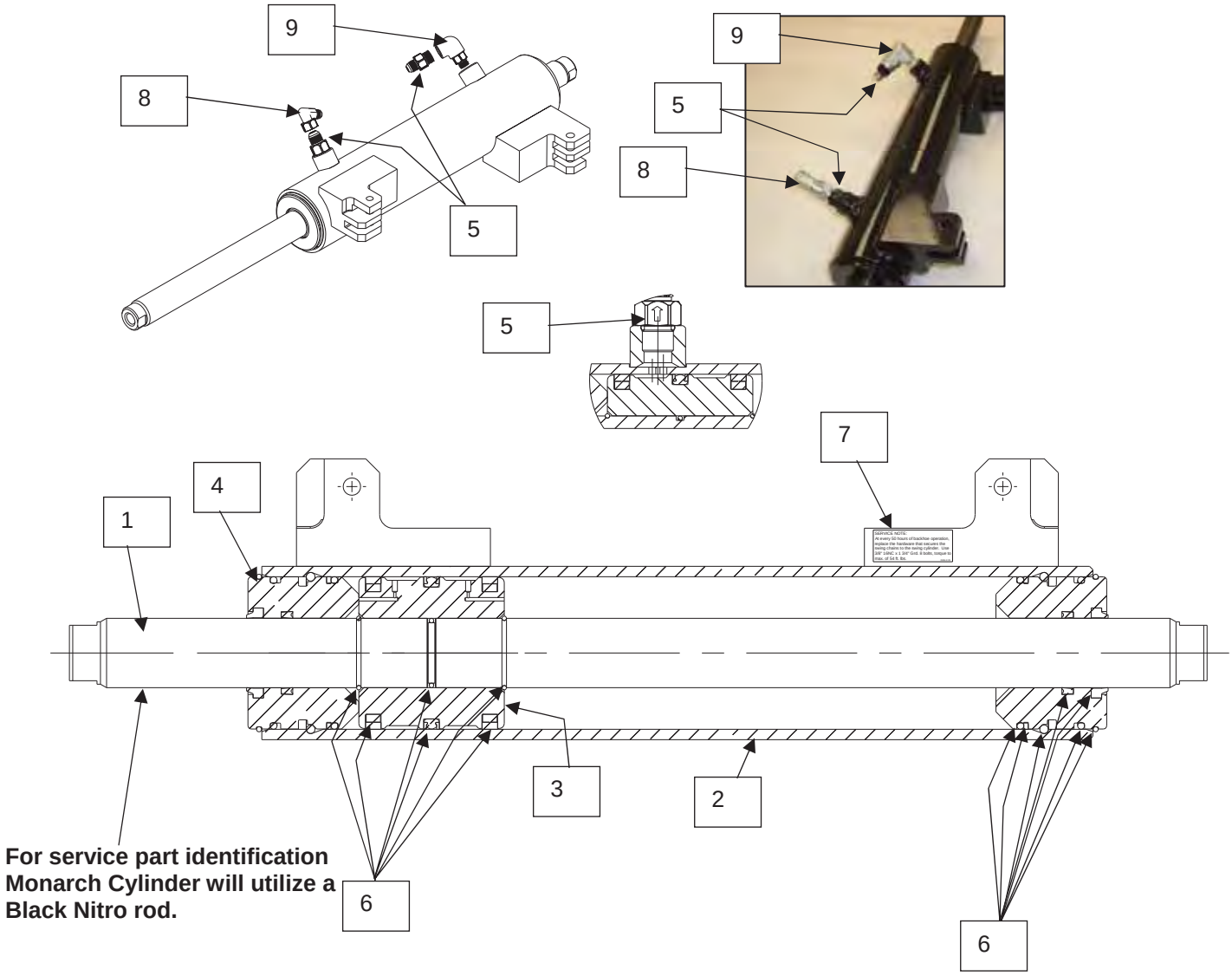


Monarch cylinder area labeled with part number

NOTE: Monarch cylinder port design.

30. MONARCH CYLINDER, SWING (1590-2067)

Reference	Description	Part No.	Qty.
0	Swing Cylinder Kit, (Includes Cylinder, Decal and fittings)	1590-2067	1
1	Rod Assembly	0200-2130	1
2	Tube Assembly	0100-2140	1
3	Piston	0405-2049	1
4	Gland	0330-2054	2
5	Orifice Fitting	0526-2009	2
6	Seal Kit	0590-2090	1
7	Decal – Service Note	0595-3176	1
8	Hydraulic Adapter ¾” JICF x ¾” JICM 90°	0586-3408-508	1
9	Hydraulic Adapter ¾” JICF x ¾” JICM 90°	0586-3106-146	1

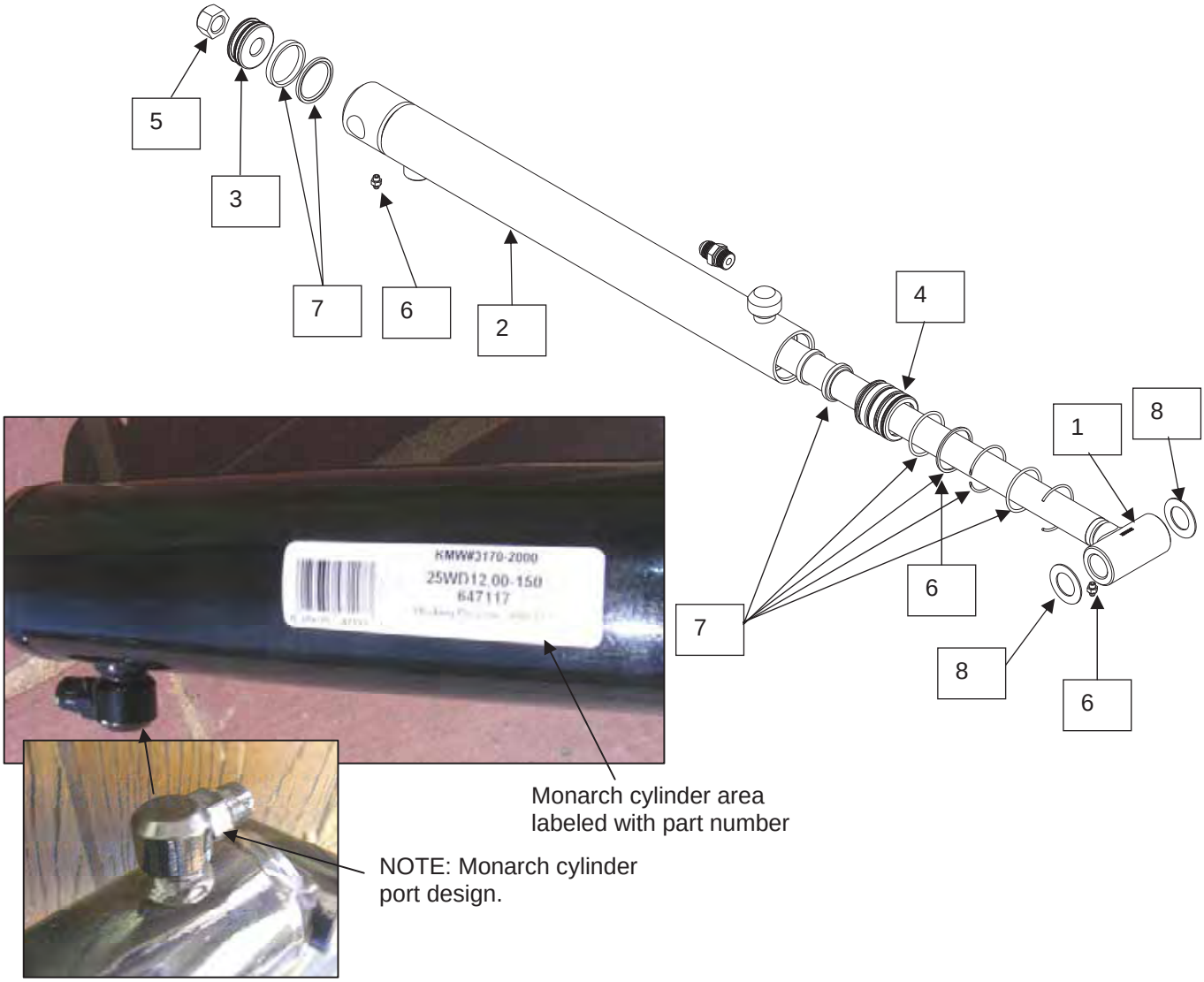


For service part identification Monarch Cylinder will utilize a Black Nitro rod.

31. MONARCH CYLINDER (3170-2024)

Reference	Description	Part No.	Qty.
0	Cylinder (complete)	3170-2024	1
1	Rod Assembly	0200-2129	1
2	Tube Assembly	0100-2139	1
3	Piston	0405-2048	1
4	Gland	0330-2053	1
5	Locknut	0530-2022	1
6	Zerk	0530-2011	2
7	Seal Kit	0590-2087	1
8	Spacer Washer	0540-2023	2
9	Hardened Inserts	0310-2010	2

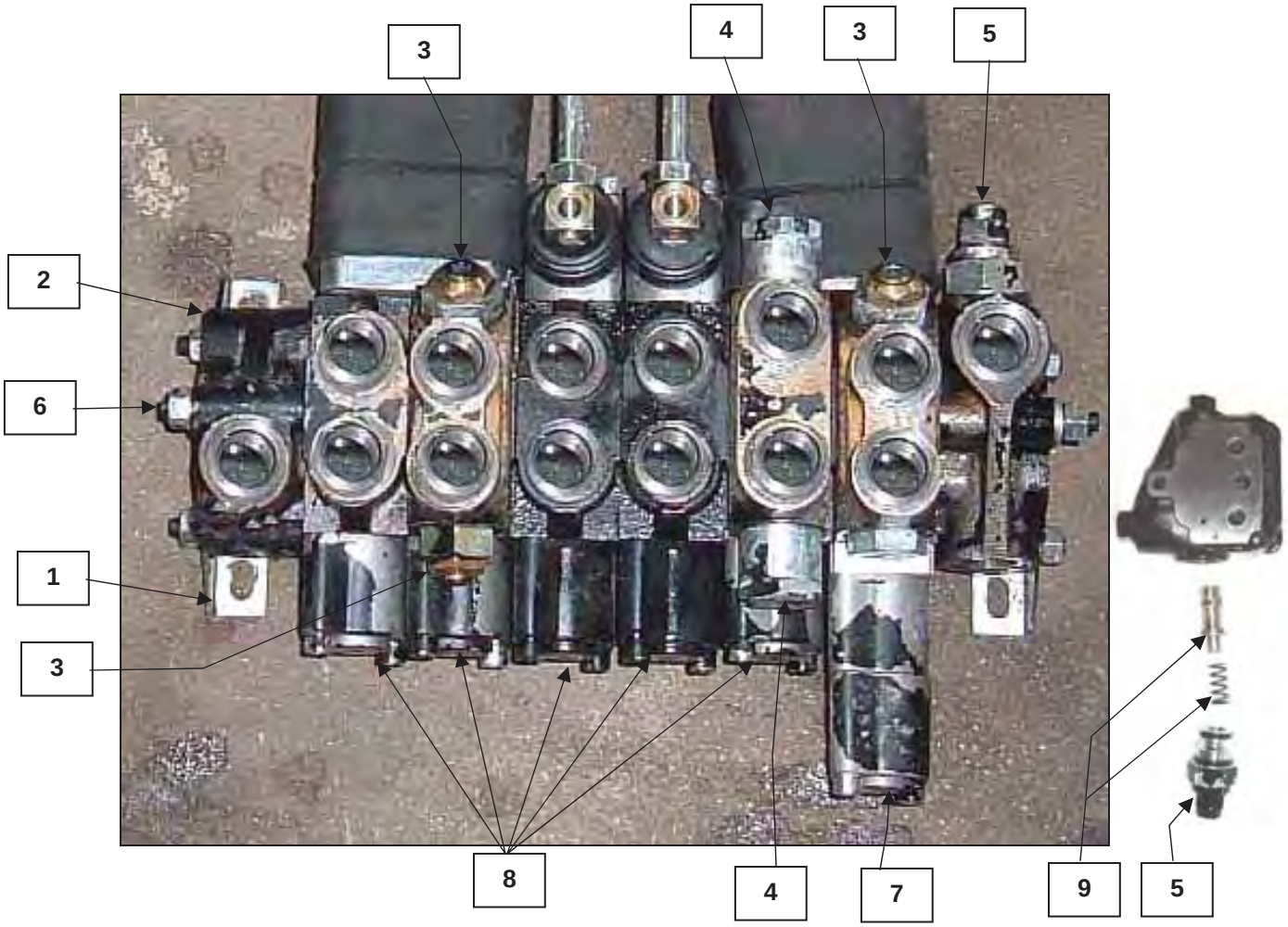
Replacement cylinder you receive may have a chrome or black nitro rod. Cylinder rod type will not affect backhoe performance.



32. VALVE

Reference	Description	Part No.	Qty.
1	Mounting Bracket	0580-6117	2
2	Valve Complete	0580-6284	1
3	Port relief	0580-6121	3
4	Port relief with A/C	0580-6122	2
5	Main relief	0580-6115	1
6	Tie bolt kit	0580-6123	1
7	Float spool kit	0580-6119	1
8	Spool kits	0580-6118	5
9	Relief Spring Kit (Contains Spring and Plunger)	0580-6288	1
	Seal kit complete	0580-6124	1

NOTE: All other items are not serviceable separately.



WARNING: Never adjust main valve relief or any port reliefs in backhoe valve. Failure to follow these instructions can cause cylinder and/or backhoe frame damage that could result in personal injury.